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86:45437

Catalyst tube assembly for steam-hydrocarbon reformer.

Morse, David C.; Howard, William W. (General Atomic Co., USA).

U.S. US 3980440 14 Sep 1976, 11 pp. (English). (United States of

America). CODEN: USXXAM. CLASS: IC: B01J008-02. NCL:

023288000M. APPLICATION: US 75-602198 6 Aug 1975.

DOCUMENT TYPE: Patent CA Section: 51 (Fossil Fuels, Derivatives

and Related Products) Section cross-reference(s): 67

A steam-CH₄ hydrocarbon reformer construction is given which provides an improved catalyst pellet configuration and catalyst tube assembly with less pressure drop and vol. The reformer, placed circumferentially around the inner tube, consists of a catalyst tube assembly which includes an outer casing. A column of stacked catalyst pellets surrounds the inner tube. An annular passageway is provided between the outer surface of the column of stacked catalyst pellets and the outer casing. The fluid contg. the reactants and products flows in this annular passageway and through a passageway in the center of the inner tube. Diagrams of the reformer are given.

Keywords

hydrocarbon reformer catalyst tube assembly

Index Entries

Reforming

of hydrocarbons, catalyst tube assembly for

Hydrocarbons, reactions

reforming of, catalyst tube assembly for

Petroleum refining catalysts

reforming, tube assembly for

Petroleum refining

reforming, catalyst tube assembly for

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86:61009

Catalyst support assembly.

Hunter, James B. (Matthey Bishop, Inc., USA). U.S. US 3993600 23

Nov 1976, 4 pp. Continuation-in-part of U.S. 3,881,877. (English).

(United States of America). CODEN: USXXAM. CLASS: IC:

B01J023-16. NCL: 252465000. APPLICATION: US 71-186630 5 Oct

1971. DOCUMENT TYPE: Patent CA Section: 67 (Catalysis and

Reaction Kinetics)

An oxidn. catalyst for NH₃ is described. It consists of a noble metal gauze (Pt 90-Rh 10 alloy) supported on a woven screen from a catalytic Kanthal alloy (Al 4.5, Cr 22, Co 0.5, remainder Fe) or a similar alloy contg. Al 4-6, Cr 20-30, Co 0.25-1, remainder Fe.

Keywords

ammonia oxidn catalyst screen support

aluminum screen catalyst oxidn ammonia

chromium screen catalyst oxidn ammonia

cobalt screen catalyst oxidn ammonia

iron screen catalyst oxidn ammonia

Index Entries

Oxidation catalysts

platinum-rhodium gauze, catalytic woven screen support assembly

for, from aluminum-chromium-cobalt-iron alloys, for

ammonia oxidn.

11125-17-0
catalytic gauze, for ammonia oxidn., support assembly for
12611-97-1
61410-32-0
catalytic woven screens from, for supports for platinum-rhodium
gauze catalysts for ammonia oxidn.
7664-41-7, reactions
oxidn. of, platinum-rhodium gauze catalysts on
aluminum-chromium-cobalt-iron alloy catalytic support
assemblies for

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93:123488

Infrared emission spectra from a heterogeneous catalyst system in reaction conditions. 1: Description of the microreactor assembly. Van Woerkom, P. C. M.; Blok, P.; Van Veenendaal, H. J.; De Groot, R. L. (Res. Dep., Akzo Res. Corp., Arnhem 6824 BM, Neth.). Appl. Opt., 19(15), 2546-50 (English) 1980. CODEN: APOPAI. ISSN: 0003-6935. DOCUMENT TYPE: Journal CA Section: 73 (Spectra by Absorption, Emission, Reflection, or Magnetic Resonance, and Other Optical Properties) Section cross-reference(s): 67
The design and construction of a microreactor with an IR transmitting window are described. The microreactor can be used to study heterogeneously catalyzed gas phase reactions in the 100-600° temp. range by analyzing the emitted IR radiation with the aid of a Fourier transform IR spectrometer. The reactor feed can be prepd. so that the reaction conditions correspond to a practical, heterogeneously catalyzed, gas phase reaction system. Product stream monitoring can be carried out to det. whether the IR emission spectra obtained originate from a stationary state in the catalytic reaction. Some results obtained with the present microreactor are given.

Keywords

IR heterogeneous catalyst microreactor
reactor micro heterogeneous catalyst

Index Entries

Catalysts and Catalysis
heterogeneous, IR emission spectra of, micro reactor assemble for
Infrared spectra
emission, from heterogeneous catalyst system, from
heterogeneous catalyst system, micro reactor assembly
for
Reactors
micro-, for heterogeneous catalyst system

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92:134595

Constructing a catalyst assembly.
Morgan, William Geoffrey; Ashworth, Richard (T. I. Silencers Ltd., Engl.). Brit. UK Pat. Appl. GB 2020190 14 Nov 1979, 6 pp. (English). (United Kingdom). CODEN: BAXXDU. CLASS: IC: B01J001-00; B01D053-34; B21D051-16; F01N003-15. APPLICATION: GB 78-17643 4 May 1978. DOCUMENT TYPE: Patent CA Section: 59 (Air Pollution and Industrial Hygiene) Section cross-reference(s): 51
Catalyst assemblies for treating combustion engine exhaust gases are manufd. by inserting a resilient catalytic element, e.g. a catalyst-coated metal honeycomb, into a metal case and uniformly reducing the internal dimensions of the case to compress the element, thus avoiding subsequent movement of the catalyst in the case. The case is compressed ~2 mm for metal honeycombs and ~6-8 mm for ceramic

honeycombs.

Keywords

exhaust gas treatment catalyst assembly
honeycomb catalyst assembly

Index Entries

Exhaust gases
treatment of, catalyst honeycomb assemblies for, manuf. of
Catalysts and Catalysis
honeycomb, for exhaust gas treatment, manuf. of assemblies of

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86:78127

System for catalytic reduction of nitrogen oxides emanating from an internal combustion engine.
Fedor, Robert J. (Gould, Inc., USA). U.S. US 3998599 21 Dec 1976, 9 pp. (English). (United States of America). CODEN: USXXAM.
CLASS: IC: B01J008-00. NCL: 023288000FC. APPLICATION: US 72-249884 3 May 1972. DOCUMENT TYPE: Patent CA Section: 59 (Air Pollution and Industrial Hygiene) Section cross-reference(s): 51, 67
Efficient, durable systems with low back-pressure buildup for catalytic redn. of NOx in exhaust consist of a no. of expanded, thin, metal foils having a redn. catalyst on the surface, one sheet contg. perforations of a different size than those in the adjacent sheet.

Keywords

nitrogen oxide redn exhaust
catalyst redn nitrogen oxide
support catalyst exhaust purifn

Index Entries

Reduction catalysts
for exhaust gases, assembly for
Exhaust gases
nitrogen oxide of, redn. of, catalyst assembly for
11104-93-1, reactions
redn. of, in exhaust gases, redn. catalyst assembly for

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89:67534

Electrochemical apparatus.
(Michelin et Cie., Fr.). Belg. BE 861785 31 Mar 1978, 18 pp. (French). (Belgium). CODEN: BEXXAL. CLASS: IC: C25B.
PRIORITY: FR 76-38622 20 Dec 1976. DOCUMENT TYPE: Patent CA Section: 72 (Electrochemistry)
An electrochem. assembly is described which may be used, for example, in a metal/air fuel cell. The plate contains a fold on 1 edge, the peripheral zone of which lies in the support obtained e.g. by injection molding of ³1 materials on this zone. Thus, 1 face of the support adjacent to the zone is joined with 1 face of this plate to form a surface with a regular junction. These faces are destined to come into contact with a moving fluid in the app. In a metal/air fuel cell the plate can be made of a mixt. of powders of C black and Ni distributed on a Ni grid, with Ag as a catalyst and poly(tetrafluoroethylene) as a wetproofing agent. The electrolyte is 4-12 N KOH which contains Zn particles (10-20 mm). A hydrophilic separator permeable to the electrolyte but impermeable to the Zn particles seps. the anode chamber from the cathode chamber in which the cathode active

material is O. The fuel cell is capable of generating 50 W.

Keywords

fuel cell assembly
metal air fuel cell

Index Entries

Carbon black, uses and miscellaneous
in metal-air fuel cell, with plate from nickel and with silver catalyst
and PTFE wet proofing agent
Fuel cells
metal-air, plate and support for
7440-22-4, uses and miscellaneous
catalyst, in fuel cell with carbon black-nickel plate and PTFE as
wet proofing agent
7440-66-6, uses and miscellaneous
in metal-air fuel cell
7440-02-0, uses and miscellaneous
in metal-air fuel cell, with carbon black, and silver catalyst with
PTFE wet proofing agent
9002-84-0
wet proofing agent, for carbon black-nickel fuel cell, with silver
catalyst

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94:196947

Catalyst assembly for exhaust systems.
Ashworth, Richard (T. I. Cheswick Silencers Ltd., Engl.). Brit. UK Pat.
Appl. GB 2047557 3 Dec 1980, 7 pp. (English). (United Kingdom).
CODEN: BAXXDU. CLASS: IC: B01D053-36; F01N003-24.
APPLICATION: GB 79-11035 29 Mar 1979. DOCUMENT TYPE:
Patent CA Section: 59 (Air Pollution and Industrial Hygiene) Section
cross-reference(s): 51
The title assembly is constructed by forming the catalyst container from
a pair of pressed metal half sections which can be joined with their
edges in overlapping abutting relationship to form a pair of longitudinal
seams, 1 edge of each abutting pair being joggled outwards so that the
other edge can slide inside it. A resilient catalytic element, e.g. catalyst
deposited in a metal or ceramic honeycomb or reticulated cellular
structure, is surrounded by crimped wire, located in 1 section, and the
2nd section is applied under pressure so that the edges interengage
and the catalyst element is compressed, the sections being welded
together. The dimensions of the container can be adjusted so that a
predetd. load can be applied to the catalytic element regardless of
dimensional tolerances.

Keywords

catalyst converter exhaust gas treatment

Index Entries

Catalysts and Catalysis
for exhaust gases, converters for, construction of
Exhaust gases
treatment of, catalytic converters for, construction of

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94:102385

Functionalized vesicular assembly. Enantioselective catalysis of ester
hydrolysis.

Murakami, Yukito; Nakano, Akio; Yoshimatsu, Akira; Fukuya, Kiyoshi
(Fac. Eng., Kyushu Univ., Fukuoka 812, Japan). J. Am. Chem. Soc.,
103(3), 728-30 (English) 1981. CODEN: JACSAT. ISSN: 0002-7863.

DOCUMENT TYPE: Journal CA Section: 22 (Physical Organic
Chemistry)

N,N-Didodecyl-Na-(6-trimethylammoniohexanoyl)histidinamide
bromide (I) forms a vesicular assembly in aq. media which acts as a
synthetic functionalized membrane. Single-compartment vesicles of
amphiphile I catalyzed the stereoselective hydrolysis of L- and
D-N-(benzyloxycarbonyl)phenylalanine p-nitrophenyl esters. The extent
of enantioselectivity exercised by I is greater than that of ordinary
micelles, increased with decreasing temp., and reached k_{obs}(L)/k_{obs}(D)
4.4 below the phase-transition temp. (4°). The present stereoselectivity
is the largest ever encountered for the hydrolysis or degrading of simple
enantiomeric esters catalyzed by chiral mol. assemblies composed of
a single mol. species.

Keywords

hydrolysis benzyloxycarbonylphenylalanine nitrophenyl ester
stereochemistry hydrolysis benzyloxycarbonylphenylalanine nitrophenyl
ester
didodecyltrimethylammoniohexanoylhistidine bromine hydrolysis
catalyst
membrane functionalized synthetic hydrolysis catalyst

Index Entries

Hydrolysis catalysts
didodecyl(trimethylammoniohexanoyl)histidine bromine, for
(benzyloxycarbonyl)phenylalanine nitrophenyl ester isomers
Kinetics of hydrolysis
of (benzyloxycarbonyl)phenylalanine nitrophenyl ester isomers,
catalytic
Hydrolysis
of (benzyloxycarbonyl)phenylalanine nitrophenyl ester isomers,
stereochem. of catalytic
Stereochemistry
stereoselectivity, in hydrolysis of (benzyloxycarbonyl)phenylalanine
nitrophenyl ester isomers
76693-52-2
catalysts, for hydrolysis of (benzyloxycarbonyl)phenylalanine
nitrophenyl esters
2578-84-9
2578-85-0
hydrolysis of, stereochem. of catalytic

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94:129499

Carbon cloth-based electrocatalytic gas diffusion electrodes,
assembly and electrochemical cells comprising them.
Lindstrom, Robert; Allen, Robert J.; Juda, Walter (Prototech Co., USA).

U.S. US 4248682 3 Feb 1981, 9 pp. (English). (United States of
America). CODEN: USXXAM. CLASS: IC: C25C001-14. NCL:
204114000. APPLICATION: US 79-79469 27 Sep 1979.

DOCUMENT TYPE: Patent CA Section: 72 (Electrochemistry) Section
cross-reference(s): 67

Thin electrocatalytic electrodes were devised and found useful in
metal-air batteries, fuel cells, Zn electrowinning cells, etc. An electrode
was made using Pt-contg. Vulcan XC-72 C and Teflon aq. dispersion
which contained 1.4 g/L of La sulfate and painting this mixt. onto a C
cloth. The coated cloth was heated for ~20 min at 340° and the
resulting electrode had a Pt content of 0.32 mg/cm² of surface area.
The Pt was present not only as the metal but also in the oxide form.

Keywords

electrode carbon cloth platinum catalyst

Index Entries

Catalysts and Catalysis

electrochem., platinum on carbon cloth impregnated with Teflon

Electrodes

gas-diffusion, carbon cloth for catalytic layer

9002-84-0

7440-06-4, uses and miscellaneous

carbon catalytic electrodes contg.

7440-44-0, uses and miscellaneous

electrodes, cloth, catalytic

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94:95039

Annelides. II: catalysis in organized media. Preparation of micellar phases of transition metal complexes and applications towards dioxygen complexation and activation.

Simon, Jacques; Le Moigne, Jacques (Cent. Rech. Macromol., CNRS, Strasbourg 67083, Fr.). J. Mol. Catal., 7(1), 137-40 (English) 1980.

CODEN: JMCADS. ISSN: 0304-5102. DOCUMENT TYPE: Journal

CA Section: 78 (Inorganic Chemicals and Reactions) Section

cross-reference(s): 67

The prodn. of polymetallic assemblies by aggregation of amphiphilic ligands in which the polar head can complex a transition metal cation is described. The properties of these assemblies towards dioxygen complexation and activation were studied.

Keywords

oxygen complexation activation micellar complex

transition metal micellar complex oxygenation

annelide surfactant transition metal oxygenation

catalyst micellar metal complex

Index Entries

Ligands

amphiphilic polymetallic assembly formation by aggregation of, oxygen complexation and activation in relation to

Surfactants

annelides, amphiphilic ligands with long paraffinic chains, for formation of polymetallic assemblies

Transition metals, compounds

micellar complexes, oxygen complexation and activation by

Micelles

transition metal complexes, oxygen complexation and activation by

Catalysts and Catalysis

transition metal micellar complexes, oxygen complexation and activation by

7782-44-7, reactions

complexation and activation of, transition metal micellar complexes in

76547-34-7

76565-18-9

prepn. of

7440-48-4, complexes with N,N''-dodecylethylene

bis[1,2-ethanediamine]

66475-61-4, cobalt complexes

75280-53-4

75280-55-6
75280-56-7
reaction of, with oxygen

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87:168858

Composition for anaerobic bonding.

McDowell, Donald J.; Patel, Purshottam S. (Felt Products Mfg. Co., USA). Fr. Demande FR 2307862 12 Nov 1976, 40 pp. (French).

(France). CODEN: FRXXBL. CLASS: IC: C09K003-10. PRIORITY:

US 75-568990 17 Apr 1975. DOCUMENT TYPE: Patent CA Section:

36 (Plastics Manufacture and Processing) Section cross-reference(s):
55, 56

Anaerobic adhesives with high mech. strength and corrosion resistance for bonding metal surfaces are manufd. from compns. contg. di- or trimethacrylate monomers, N-nitrosoamines, inorg. salt polymn. initiators, and combinations of tertiary amines, disubstituted aliph. monocarboxylic amides, and org. sulfides as accelerators. Thus, a mixt. contg. tetraethylene glycol dimethacrylate (contg. 100 ppm hydroquinone [123-31-9]) 100, K2S2O8 0.55, benzoylsulfimide [81-07-2] 0.5, dimethyl-p-toluidine [99-97-8] 0.3, and N-nitrosodiphenylamine [86-30-6] 0.2 parts was used to bond steel bolt and nut assemblies to give assemblies for which 111 cm/kg force was needed to break the bond and 325 cm/kg force was needed to turn the bolt after breaking the bond.

Keywords

anaerobic adhesive acrylate polymer
polymn catalyst inorg salt
hydroquinone polymn inhibitor
potassium perchlorate polymn initiator
benzoylsulfimide polymn accelerator
dimethyltoluidine polymn accelerator
amine tertiary polymn accelerator
nitrosodiphenylamine polymn accelerator
toluidine dimethyl polymn accelerator
quinone polymn inhibitor
amide disubstituted polymn accelerator
steel adhesive acrylate polymer
bolt nut assembly adhesive

Index Entries

Nuts (mechanical)

adhesives for assemblies contg. bolts and, anaerobic,
polymethacrylates as

Bolts

adhesives for assemblies contg. nuts and, anaerobic,
polymethacrylates as

Polymerization catalysts

for polymethacrylate monomers in anaerobic adhesives

Polymerization inhibitors

hydroquinone, for polymethacrylate monomers in anaerobic
adhesives

Adhesives

anaerobic, polymethacrylates, for metals

7440-66-6, uses and miscellaneous

12597-68-1, uses and miscellaneous

12597-69-2, uses and miscellaneous

adhesives for, anaerobic, polymethacrylates as

25101-32-0

25721-76-0

26426-04-0

27435-31-0
 64696-13-5
 adhesives, anaerobic, for metals
 68-12-2, uses and miscellaneous
 81-07-2
 86-30-6
 99-97-8
 100-75-4
 612-98-6
 621-64-7
 2788-23-0
 7601-89-0
 7727-21-1
 7727-54-0
 7775-27-1
 7778-74-7
 7790-98-9
 catalysts, for polymn. of polymethacrylate monomers in anaerobic
 adhesives
 123-31-9, uses and miscellaneous
 polymn. inhibitors, for diacrylates in anaerobic adhesives

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86:95333

Reactor assembly for reducing automotive pollutant emissions.
 Cocchiara, Franco; Del Grosso, Remo (Exxon Research and
 Engineering Co., USA). U.S. US 3986840 26 Oct 1976, 8 pp.
 (English). (United States of America). CODEN: USXXAM. CLASS:
 IC: F01N003-15. NCL: 023288000F. PRIORITY: IT 73-51581 20 Jul
 1973. DOCUMENT TYPE: Patent CA Section: 59 (Air Pollution and
 Industrial Hygiene)

A catalytic reactor assembly for purifying exhaust gas from internal
 combustion engine comprises a first bed of catalytic material which
 promotes reducing reactions in exhaust gas from the engine between
 unburned and partially burned fuel components and NOx whereby the
 latter is substantially converted to N and a second bed of catalytic
 material which promotes oxidizing reactions in the presence of added
 air to oxidize unburned and partially burned components of exhaust gas
 from the first bed. Exhaust gas is constrained to pass substantially
 radially outwards from the interior of the first bed to a collection space
 and is then directed to the interior of the second bed for passage
 radially outwardly therethrough before discharge to the atm. The two
 catalytic beds are preferably cylindrical or annular, and located
 end-to-end for max. conversions with min. pressure drop. Baffle means
 are located between the catalytic beds for directing the exhaust gas
 from the collection space around the first bed to the interior of the
 second catalyst bed. Addnl., either the axis of the second bed is off-set
 from the axis of the first bed or the second bed has a non-uniform
 porosity so that there is a substantially const. pressure drop across any
 radial point in the second bed.

Keywords

exhaust gas catalytic converter
 reactor catalytic exhaust gas
 oxidn catalyst exhaust gas

Index Entries

Exhaust gases
 catalytic reactor fro redn. of automotive
 Oxidation catalysts
 for exhaust gases purifn.
 Reactors

catalytic, for exhaust gases

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103:144770

Electrode-confined catalyst systems for use in optical-to-chemical energy conversion.

Daube, Karen A.; Harrison, D. Jed; Mallouk, Thomas E.; Ricco, Antonio J.; Chao, Shuchi; Wrighton, Mark S.; Hendrickson, William A.; Drube, Arnold J. (Dep. Chem., Massachusetts Inst. Technol., Cambridge, MA 02139, USA). J. Photochem., 29(1-2), 71-88 (English) 1985. CODEN: JPCMAE. ISSN: 0047-2670. DOCUMENT TYPE: Journal CA

Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 38, 67, 72

The characterization of redox polymer-noble metal combinations as catalysts for the redn. of water and aq. CO₂ is described. Emphasis is on the demonstration of rational synthetic methods applied to interfaces and the relation of surface structure and function. Effective electrode-bound catalysts for H evolution can be derived from combination of a redox polymer and a noble metal (Ag, Pd, Pt, and Rh), Rh being a superior catalyst. The redox polymers were viologen-based and cobalticenium-based reagents. Findings relating to a surface-modification procedure for p-InP to catalyze photoelectrochem. H generation using a cobalticenium reagent and deposited Rh are summarized. A catalyst system is described for the electrochem. and photoelectrochem. redn. of aq. CO₃H⁻.

Keywords

photoelectrochem cell electrode catalyst
silver redox polymer catalyst photoelectrochem
palladium redox polymer catalyst photoelectrochem
platinum redox polymer catalyst photoelectrochem
rhodium redox polymer catalyst photoelectrochem
viologen noble metal catalyst photoelectrochem
cobalticenium noble metal catalyst photoelectrochem
water redn catalyst photoelectrochem
carbon dioxide redn catalyst photoelectrochem
indium phosphide hydrogen manuf photoelectrochem

Index Entries

Electrodes

photoelectrochem., catalysts bound to, noble metal-redox polymer, for hydrogen and chem. prodn.
7440-05-3, uses and miscellaneous
7440-06-4, uses and miscellaneous
7440-16-6, uses and miscellaneous
catalytic activity of, deposited on redox polymers, for optical to chem. energy conversion
50926-11-9
cathodes, hydrogen evolution at assembly of noble metal-redox polymer-
22398-80-7, uses and miscellaneous
cathodes, photoelectrochem., hydrogen evolution at assembly of noble metal-redox polymer-
7440-21-3, uses and miscellaneous
cathodes, photoelectrochem., redn. of aq. carbon dioxide at assembly of noble metal-redox polymer-
98517-02-3, polymers
98536-56-2, polymers
electrode derivatized with, for optical to chem. energy conversion
71-47-6, preparation
formation of, in photoelectrochem. redn. of aq. carbon dioxide at assembly of noble metal-redox polymer-silicon electrode

1333-74-0, preparation
manuf. of, photoelectrochem., electrode-catalyst assembly for
124-38-9, reactions
redn. of aq., photoelectrochem., electrode-catalyst assembly for

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104:150379

Photocurable epoxy resin adhesives.

Yamase, Yukio; Mori, Atsushi (Nippon Soda Co., Ltd., Japan). Jpn.

Kokai Tokkyo Koho JP 60217231 A2 30 Oct 1985 Showa, 11 pp.

(Japanese). (Japan). CODEN: JKXXAF. CLASS: ICM: C08G059-40.

ICS: C08G059-68; C09J003-16. APPLICATION: JP 84-70896 11 Apr

1984. DOCUMENT TYPE: Patent CA Section: 38 (Plastics

Fabrication and Uses) Section cross-reference(s): 75

A photocurable epoxy resin adhesive for assembly of a liq. crystal display devices, giving a product with high delamination strength and high thermal shock resistance, comprises a butadiene polymer contg. an epoxy group, an epoxy resin, and a photosensitive arom. onium salt catalyst. Thus, an adhesive compn. comprising an Epo Tohto YD 8125-modified carboxy-terminated nitrile rubber 50, Epikote 807 50, diethylene glycol monobutyl ether acetate 12, 50% triphenylphenacylphosphonium tetrafluoroborate soln. 8, KBM 403 1, and Aerosil 380 14 parts, exhibiting pot life '30 days, was coated between a glass plate to a thickness of 10 m and UV-cured for 4.5 s to give a product exhibiting delamination strength 4.7 kg/2 mm (substrate breakage). An Araldite MY 720-based adhesive compn. did not cure after 60 s of UV irradiation.

Keywords

bisphenol epoxy resin adhesive photocurable
epoxidized nitrile rubber photocurable adhesive
phenylphenacylphosphonium fluoroborate curing catalyst epoxy
liq crystal display app adhesive
phosphonium fluoroborate curing catalyst epoxy

Index Entries

Epoxy resins, uses and miscellaneous
alicyclic, adhesives, photocurable, contg. epoxidized
butadiene-contg. rubbers, in assembly of
liq.-crystal-display devices
Epoxy resins, uses and miscellaneous
bisphenol A-based, adhesives, photocurable, contg. epoxidized
butadiene-contg. rubbers, in assembly of
liq.-crystal-display devices
Phenolic resins, uses and miscellaneous
epoxy-, adhesives, photocurable, contg. epoxidized
butadiene-contg. rubbers, in assembly of
liq.-crystal-display devices
Optical imaging devices
liq.-crystal, glass cells in, photocurable epoxy resin adhesives in
assembly of
Epoxy resins, uses and miscellaneous
phenolic, adhesives, photocurable, contg. epoxidized
butadiene-contg. rubbers, in assembly of
liq.-crystal-display devices
Crosslinking catalysts
photochem., arom. onium salts, epoxy resin adhesives contg., in
assembly of liq.-crystal-display devices
Adhesives
photocurable, epoxy resins, contg. epoxidized butadiene-contg.
rubbers, in assembly of liq.-crystal-display devices
25085-98-7

29797-71-5

71245-30-2

adhesives, photocurable, contg. epoxidized butadiene-contg.

rubbers, in assembly of liq.-crystal-display devices

25085-99-8, reaction products with carboxy-terminated

butadiene-contg. rubbers

adhesives, photocurable, contg. epoxy resins, in assembly of

liq.-crystal-display devices

1108-21-0

57840-38-7

catalysts, for photocrosslinking of epoxy resin adhesive compns. in

assembly of liq.-crystal-display devices

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98:184875

Combustion apparatus with catalyst for nitrogen oxide removal.

(Matsushita Electric Industrial Co., Ltd., Japan). Jpn. Kokai Tokkyo

Koho JP 57196011 A2 1 Dec 1982 Showa, 4 pp. (Japanese).

(Japan). CODEN: JKXXAF. CLASS: IC: F23G007-06; B01D053-36;

B01J023-86. APPLICATION: JP 81-82259 28 May 1981.

DOCUMENT TYPE: Patent CA Section: 59 (Air Pollution and Industrial

Hygiene) Section cross-reference(s): 67

An Fe-Cr or Fe-Cr-Ni base alloy is spray coated on the end of

combustion chamber or in the flue of a combustion app. (home space

heater) to reduce NOx. Thus, at the top of a gas burner assembly, a

mesh spray coated with an Fe-Cr or Fe-Cr-Ni alloy contg. C, Co, Ti, Al,

Si, Nb, Ta, P, Mo, or Cu was placed to reduce NO2 to NO. The redn.

was 70-76% with a catalyst porosity of 5-56%.

Keywords

space heater catalyst burner assembly

iron chromium nickel catalyst heater

nitrogen dioxide redn space heater

Index Entries

Air pollution

by space heaters, prevention of, catalysts-burner assembly for

Reduction catalysts

iron-chromium-nickel, for space heater flue gas treatment

Flue gases

nitrogen dioxide removal from, from space heaters,

catalysts-burner assembly for

Heating systems and Heaters

space, gas-fired, catalyst-burner assembly for, nitrogen dioxide

redn. in relation to

11122-73-9

12649-48-8

catalyst, in space heater burner, nitrogen dioxide redn. in relation

to

10102-44-0, reactions

redn. of, in flue gas in space heaters, catalyst-burner assembly

for

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99:164677

Phase-transfer catalysis in a segmented flow assembly. Study of
transfer and reaction rates.

Kinkel, J. F. M.; Tomlinson, E. (Dep. Pharm., Univ. Amsterdam,

Amsterdam 1018TV, Neth.). Sep. Sci. Technol., 18(9), 857-66

(English) 1983. CODEN: SSTEDS. ISSN: 0149-6395. DOCUMENT

TYPE: Journal CA Section: 67 (Catalysis, Reaction Kinetics, and

Inorganic Reaction Mechanisms) Section cross-reference(s): 22
 A study was made of the appropriateness of a combined segmented flow/phase-splitter assembly for examg. the kinetics of liq./liq. phase/transfer catalysis reactions. By using hydrazobenzene and oestrone as oil-sol. substrates, MnO_4^- as the oxidizing ion and Bu_4N^+ ion as the pairing ion, the influence of reaction rate on the rate of MnO_4^- transfer from an aq. phase to an oil phase was detd. Results indicate that the given assembly is suitable for the study of fast reactions occurring in 2-phase systems.

Keywords

phase transfer catalyst segmented flow
 combined segmented flow app kinetics
 permanganate phase transfer catalyst

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 10549-76-5
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 14333-13-2
 phase transfer kinetics of, segmented flow assembly for study of

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104:68285
 Prospects for a new kind of synthesis: assembly of molecular components to achieve functions.
 Wrighton, Mark S. (Dep. Chem., Massachusetts Inst. Technol., Cambridge, MA 02139, USA). Comments Inorg. Chem., 4(5), 269-94 (English) 1985. CODEN: COICDZ. ISSN: 0260-3594. DOCUMENT TYPE: Journal; General Review CA Section: 21 (General Organic Chemistry) Section cross-reference(s): 6, 29, 67, 78
 A review with 47 refs. Synthetic chem. systems inspired by biol. systems and by microelectronic devices are reviewed. The examples include multicomponent catalysts, photosynthetic app. for solar energy conversion, diodes, and transistors.

Keywords

review org synthesis
 photosynthesis solar energy conversion review
 diode org synthesis review
 transistor org synthesis review
 multicomponent catalyst org synthesis review

Index Entries

Photosynthesis
 as model for solar energy conversion
 Synthesis
 bio-, as model for org. synthesis
 Electronics
 micro-, as model for assembly of mol. components
 Synthesis
 org., by assembly of mol. components

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100:40345

Optimization of silica gel-based inorganic matrices by the chemical assembly method.

Postnov, V. N. (USSR). Napravlenyi Sint. Tverd. Veshchestv, 1, 118-26 (Russian) 1983. CODEN: NSTVDO. DOCUMENT TYPE:

Journal CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms) Section cross-reference(s): 34, 66

The synthesis of inorg. matrices, with high capacity, is described. It involves a series of the consecutive irreversible surface reactions, involving surface functional groups and low mol.-wt. compds. (mol. layering). The SiO₂ surface OH groups react with TiCl₄ or SiCl₄ (MCl₄) forming (YTiO)_mMCl₄-m which subsequently is hydrolyzed to (YSiO-)_m(OH)₄-m. The processes are repeated 2-6 times. Grafting of *p*-phenylethyltrichlorosilane and their chloromethylation by Me chloromethyl ether in the presence of SnCl₄ catalyst and of chemisorption of tert-butyloxycarbonyl-L-alanine are described also. The high reactivity of the grafted groups can be used in solid-phase synthesis of peptides. Glycyl-L-alanine was synthesized.

Keywords

grafted silica catalyst glycyl alanine synthesis
peptide synthesis layered stereospecific catalyst

Index Entries

Peptides, preparation
stereospecific layered catalysts for, prepn. of
Catalysts and Catalysis
stereospecific, layered, for peptide synthesis, prepn. of
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7631-86-9, reactions
grafting of, in prepn. of stereospecific layered catalysts for peptide synthesis
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940-41-0
7550-45-0, reactions
15761-38-3
reaction of, with silica surface, in prepn. of layered stereospecific catalyst for peptides
3695-73-6
synthesis of, stereospecific layered catalysts for, prepn. of

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104:110020

Cobalt-catalyzed one-step assembly of B-ring aromatic steroids from acyclic precursors.

Lecker, Stewart H.; Nguyen, Nhan H.; Vollhardt, K. Peter C. (Dep. Chem., Univ. California, Berkeley, CA 94720, USA). J. Am. Chem. Soc., 108(4), 856-8 (English) 1986. CODEN: JACSAT. ISSN: 0002-7863. DOCUMENT TYPE: Journal CA Section: 32 (Steroids)

Me₃SiCYCCH₂CH₂CYCH was lithiated at C-3 and C-6 and then regioselectively alkylated first at the propargylic and then at the alkynyl position to give enediynes I (R = MeOCH₂CH₂OCH₂, Me; R₁ = H, Me). These were elaborated to the enetriynes II (R, R₁ = H, Me; R₂ = Ac), ready substrates for CpCo(CO)₂-catalyzed (Cp = cyclopentadienyl) cyclizations to B-ring arom. steroids III. The C,D-ring juncture is exclusively trans, as established by spectroscopic and chem. means, the latter consisting of correlation with known compds., including equilenin.

Keywords

cobalt catalyst enetriyne cyclization
 arom steroid synthesis one step
 estratrienediol
 methyleneethynylpentadecadiyne cyclization stereochem

Index Entries

Cycloaddition reaction catalysts
 dicarbonylcyclopentadienylcobalt, for enetriyne derivs., arom.
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 steroids
 19-Norsteroids
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 Cycloaddition reaction
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 94621-19-9
 100044-84-6
 100044-85-7
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 12078-25-0
 catalyst, for stereoselective cyclizations of enetriynes, in total
 synthesis of arom. steroids
 1578-34-3
 consecutive alkylation reactions of, with bromoalkenols and
 iodopropanal acetal
 100044-74-4
 100044-75-5
 100044-76-6
 100044-77-7
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 100044-72-2
 prepn. and consecutive acetylation, demethylation, hydrolysis, and
 oxidn. of
 100044-82-4
 100044-83-5
 100082-21-1
 prepn. and consecutive deblocking, Grignard propynylation, and
 desilylation of
 100044-86-8
 prepn. and dehydrogenation of
 100163-40-4
 prepn. and oxidn. of
 100044-78-8
 100044-79-9
 prepn. and thermal cyclization of
 100044-73-3
 100044-80-2
 100044-81-3
 prepn. of
 83665-55-8
 substitution reactions of, with silylhexadiyne derivs.
 632-38-2
 total synthesis of, by cobalt-catalyzed stereoselective cyclization of
 enetriyne deriv.

102:169762

Gas generator with ratchet no-back and method.

Kasabian, George (Garrett Corp., USA). U.S. US 4489549 A 25 Dec

1984, 10 pp. (English). (United States of America). CODEN:

USXXAM. CLASS: ICM: F02C003-20. ICS: F01N003-15. NCL:

060039020. APPLICATION: US 83-524047 17 Aug 1983.

DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical,

Radiational, and Thermal Energy Technology) Section

cross-reference(s): 47

A gas generator has a 1-way ratchet assembly which compensates for compaction and degrdn. in the catalyst bed to reduce destructive oscillatory vibration in the generator, thus substantially extending the life and assuring dependable performance of the generator. The generator has application as emergency-power units for military aircraft. Such generators typically use a pulsed spray of liq. N₂H₄ into a catalyst bed such as Shell 405 in which hot gases are produced.

Keywords

fuel gas generator ratchet assembly
hydrazine fuel gas generator
catalyst hydrazine fuel gas generator

Index Entries

Fuel gas manufacturing
generators with 1-way ratchet assembly for
7439-88-5, uses and miscellaneous
39434-82-7
catalysts, in fuel-gas manufg. units

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107:200892

Process for the hydrogenation of organic compounds.

Cornelison, Richard C.; Alcorn, William R. (Camet, Inc., USA). Eur.

Pat. Appl. EP 233642 A2 26 Aug 1987, 26 pp. DESIGNATED

STATES: R: AT, BE, CH, DE, ES, FR, GB, IT, LI, NL, SE. (European

Patent Organization) CODEN: EPXXDW. CLASS: ICM:

C07B035-02. ICS: C11C003-12. APPLICATION: EP 87-102300 18

Feb 1987. PRIORITY: US 86-830636 18 Feb 1986. DOCUMENT

TYPE: Patent CA Section: 45 (Industrial Organic Chemicals, Leather,

Fats, and Waxes) Section cross-reference(s): 23, 47, 67

Org. compds., (esp. animal or vegetable oils or fat) are hydrogenated in the presence of a catalyst comprising a metal substrate, a washcoat consisting of alumina, titania, silica, magnesia, a zeolite, or mixts. of the above, adhered to the substrate, and Pd, Pt, Ni, Cu, Ag, or mixts. of the above deposited on the washcoat. Such catalysts are in the form of a corrugated structure having a plurality of elongated channels. Thus, an alumina coated stainless steel foil contg. an alumina washcoat and Pd at a loading of 40 g/ft³ catalysts was prepd. The foil had a thickness of 0.0025 in., the catalyst contained 160 cells/in.² and had an internal surface area of 579 ft²/ft³. Soybean oil having an I value 130 was recirculated through an autoclave which contained the catalyst assembly at 212°F/1.5 atm until the I value was reduced to 110.

Keywords

hydrogenation catalyst assembly supported film
soybean oil hydrogenation
org compd hydrogenation
palladium hydrogenation catalyst washcoat
platinum hydrogenation catalyst washcoat supported
nickel hydrogenation catalyst washcoat supported
copper hydrogenation catalyst washcoat supported

silver hydrogenation catalyst washcoat supported
vegetable oil hydrogenation supported catalyst
fat animal hydrogenation supported catalyst
stainless steel film hydrogenation catalyst

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Oils, glyceridic

Soybean oil

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vegetable oils or fats

Hydrogenation

of animal or vegetable oils or fats

Zeolites, uses and miscellaneous

washcoat, contg. catalytic metals, supported on metal substrate, for

hydrogenation of vegetable or animal oils or fats

Fats, reactions

Glycerides, reactions

unsatd., hydrogenation of, metal foil-supported catalysts for

7440-02-0, uses and miscellaneous

7440-05-3, uses and miscellaneous

7440-06-4, uses and miscellaneous

7440-22-4, uses and miscellaneous

7440-50-8, uses and miscellaneous

catalysts, in washcoats supported on metallic substrates, for

hydrogenation of animal or vegetable oils or fats

1333-74-0, unspecified

hydrogenation, of animal or vegetable oils or fats

1309-48-4, uses and miscellaneous

1344-28-1, uses and miscellaneous

7631-86-9, uses and miscellaneous

13463-67-7, uses and miscellaneous

washcoat, contg. catalytic metals, supported on metal substrate, for

hydrogenation of vegetable or animal oils or fats

1335-30-4

zeolites, washcoat, contg. catalytic metals, supported on metal

substrate, for hydrogenation of vegetable or animal oils or

fats

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109:193743

Localization of platinum in low catalyst loading electrodes to attain
high power densities in SPE fuel cells.

Ticianelli, Edson A.; Derouin, Charles R.; Srinivasan, Supramaniam
(Los Alamos Natl. Lab., Los Alamos, NM 87544, USA). J. Electroanal.
Chem. Interfacial Electrochem., 251(2), 275-95 (English) 1988.

CODEN: JEIEBC. ISSN: 0022-0728. DOCUMENT TYPE: Journal CA

Section: 52 (Electrochemical, Radiational, and Thermal Energy

Technology) Section cross-reference(s): 38, 67, 72

The activation energy, and ohmic and mass transport overpotential of
electrodes in solid polymer electrolyte (SPE) fuel cells were minimized
by using thin electrocatalytic layers and by localizing the Pt near the
front surface of the electrode. The electrode fabrication methods were:
use of 20-40% Pt/C; sputtering of a thin film (50 nm) of Pt on a
state-of-the-art Prototech electrode; and combination of the 2 methods.

The optimum electrode configuration was that of sputtered Pt film,
which had a Pt utilization of 15-20% and a cell potential of 0.600 and
0.540 V with H₂O and H₂/air as reactants, resp., at a c.d. of 1 A/cm²,
80°, and 3/5 atm. pressure.

Keywords

electrode platinum catalyst loading utilization
 fuel cell electrode platinum catalyst
 polymer electrolyte fuel cell optimization
 hydrogen oxygen fuel cell electrode

Index Entries

Carbon fibers, uses and miscellaneous
 electrode assembly contg., platinum catalyst loading and
 utilization by, for solid polymer electrolyte fuel cell
 Kinetics, reaction
 electrochem., of fuel cell electrode, platinum loading and utilization
 effect on
 Electrodes
 fuel-cell, catalytic, platinum loading and utilization in, fabrication
 procedure for, for solid polymer electrolyte fuel cells
 7440-44-0, unspecified
 carbon fibers, electrode assembly contg., platinum catalyst
 loading and utilization by, for solid polymer electrolyte fuel
 cell
 7440-06-4, uses and miscellaneous
 catalysts, loading and utilization of, electrode optimization by, for
 solid polymer electrolyte fuel cells
 31175-20-9
 electrode assembly contg., platinum catalyst loading and
 utilization by, for solid polymer electrolyte fuel cell

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110:216313

Gas recombination assembly for electrochemical cells.
 Levy, Isaac; Charkey, Allen (Energy Research Corp., USA). U.S. US
 4810598 A 7 Mar 1989, 6 pp. (United States of America) CODEN:
 USXXAM. CLASS: ICM: H01M010-52. NCL: 429059000.
 APPLICATION: US 88-172632 24 Mar 1988. DOCUMENT TYPE:
 Patent CA Section: 52 (Electrochemical, Radiational, and Thermal
 Energy Technology)
 An assembly, for use in promoting catalytic recombination of gases in a
 battery, comprises a catalyst strip; a hydrophobic, gas porous film
 enveloping the catalyst strip; and 1st and 2nd gas-porous, metallic
 layers together encasing the hydrophobic film to form a sandwich
 structure. The sandwich construction of metallic layers and film is
 formed into a spiral with a tab for connection to the battery. The
 metallic layers and tab comprise Ni. The hydrophobic film comprises
 unsintered PTFE, and the catalyst comprises a Pt-PTFE mixt.

Keywords

battery gas recombination assembly
 platinum catalyst gas recombination battery

Index Entries

Batteries, secondary
 gas recombination assembly for
 7782-44-7, uses and miscellaneous
 assembly for recombination of, with hydrogen, for batteries
 1333-74-0, uses and miscellaneous
 assembly for recombination of, with oxygen, for batteries
 7440-06-4, uses and miscellaneous
 catalyst, hydrogen-oxygen recombination, for batteries

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106:122943

Method for removing spent catalyst from a reactor tower and assembly for facilitating same.

Al-Saigh, Abbas (Alberta Energy Co. Ltd.; Canadian Occidental Petroleum Ltd.; Esso Resources Canada Ltd.; Gulf Canada Ltd., Can.).

U.S. US 4642223 A 10 Feb 1987, 7 pp. (United States of America)

CODEN: USXXAM. CLASS: ICM: B01J008-04. NCL: 422191000.

APPLICATION: US 85-719208 2 Apr 1985. DOCUMENT TYPE:

Patent CA Section: 51 (Fossil Fuels, Derivatives, and Related Products) Section cross-reference(s): 47

A basket is removably inserted in the upper end of each drain tube in the interbed assemblies of a catalytic tower (e.g., a conventional hydrotreater) contg. catalyst beds that can be removed upwardly by vacuuming. The basket has a grid for a bottom wall so that catalyst particles above the wall are retained but fluid (e.g., untreated gas oil) being treated in the tower can easily pass through. The provision of the baskets makes it possible to downwardly drain spent catalyst from the lower bed sections while simultaneously vacuuming it upwardly from the upper bed sections.

Keywords

gas oil hydrotreater spent catalyst
interbed assembly hydrotreater catalyst removal
reactor spent catalyst removal basket

Index Entries

Reactors

catalytic, interbed, for hydrotreating of gas oils, with simultaneously upward-downward removal of spent catalysts
Petroleum refining catalysts
hydroprocessing, spent, removal of, in interbed assembly, with simultaneous upward vacuuming and downward draining

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114:142309

Organo clay assemblies for triphase catalysis.

Lin, Chi Li; Pinnavaia, Thomas J. (Cent. Fundam. Mater. Res., Michigan State Univ., East Lansing, MI 48824, USA). Chem. Mater., 3(2), 213-15 (English) 1991. CODEN: CMATEX. ISSN: 0897-4756.

DOCUMENT TYPE: Journal CA Section: 22 (Physical Organic Chemistry)

Long-chain quaternary ammonium ion exchange forms of the smectite clay, hectorite, are shown to be efficient, stable, and recyclable triphase catalysts for org. chem. conversions. Alkyl bromides in toluene readily are converted to nitriles, thiocyanates, sulfides and ethers in the presence of [(n-C₈H₁₇)₃NMe]⁺-hectorite under triphase reaction conditions. Also, the facile oxidn. of alcs., C-alkylation of nitriles and dehalogenation of vic-dibromides can be accomplished under analogous reaction conditions. The exceptional triphase catalytic activity is related to the unique ability of the organo clay to form thin, membrane-like assemblies of platelets at the liq.-liq. interface of an oil/water type of emulsion. Reagents in the emulsified liq. phases are readily transferred to the interface of the clay assemblies for facile reaction. The emulsion, however, can easily be broken by gravity, low-speed centrifugation, or by filtration, thus allowing for the convenient recovery of both the catalyst and the reaction products. The phase transfer products of hectorite-supported alkylammonium ions of different chain lengths are correlated with the orientation of the hydrocarbon chains relative to the clay basal surfaces.

Keywords

hectorite ammonium ion exchanged catalyst

organo clay assembly triphase catalyst
cyanation bromopentane triphase catalyst

Index Entries

Kinetics of cyanation
of bromopentane, in presence of hectorite quaternary ammonium
salts as triphase catalysts
Quaternary ammonium compounds, uses and miscellaneous
triphase catalysts with hectorite, for org. reactions
Cyanation catalysts
triphase, hectorite quaternary ammonium salts, for bromopentane
Catalysts and Catalysis
triphase, hectorite quaternary ammonium salts, for org. reactions
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872-10-6
2050-04-6
5558-33-8
32446-40-5
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100-52-7, preparation
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hectorite-quaternary ammonium salt triphase catalysts
12173-47-6
quaternary ammonium salts, triphase catalysts, for cyanation of
bromopentane

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114:202350

A multisubunit ribozyme that is a catalyst of and template for
complementary strand RNA synthesis.
Doudna, Jennifer A.; Couture, Sandra; Szostak, Jack W. (Dep. Mol.
Biol., Massachusetts Gen. Hosp., Boston, MA 02114, USA). Science
(Washington, D. C., 1983-), 251(5001), 1605-8 (English) 1991.
CODEN: SCIEAS. ISSN: 0036-8075. DOCUMENT TYPE: Journal CA
Section: 7 (Enzymes) Section cross-reference(s): 6
Derivs. of the sunY self-splicing intron efficiently catalyzed the synthesis
of complementary strand RNA by template-directed assembly of
oligonucleotides. These ribozymes were sepd. into three short RNA
fragments that formed active catalytic complexes. One of the
multisubunit sunY derivs. catalyzed the synthesis of a strand of RNA
complementary to one of its own subunits. These results suggest that
prebiotically synthesized oligonucleotides might have been able to
assemble into a complex capable of self-replication.

Keywords

ribozyme multisubunit complementary RNA formation
replicase RNA prebiotic multisubunit ribozyme model

Index Entries

Evolution
prebiotic, RNA replicase assembly in, multisubunit
ribozyme-mediated complementary RNA formation in

relation to
 Ribonucleic acid formation
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 replicase prebiotic assembly in relation to
 Ribonucleic acids
 ribozymes, self-splicing, RNA complementary strand formation by
 mutated derivs. of multisubunit of, of bacteriophage T4
 sunY group I intron, RNA replicase prebiotic assembly in
 relation to
 9026-28-2
 prebiotic assembly of, multisubunit ribozyme-mediated
 complementary strand RNA formation in relation to

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108:40568

Apparatus for combustion of ammonia.
 Hartermann, Ralf Uwe; Premel, Ulrich; Thoenes, Gustav (Steinmueller,
 L. und C., G.m.b.H., Fed. Rep. Ger.). Ger. DE 3638115 C1 5 Nov
 1987, 4 pp. (Germany) CODEN: GWXXAW. CLASS: ICM:
 C01B021-28. ICS: F23J015-00; B01J035-00. ICA: C01B021-26.
 APPLICATION: DE 86-3638115 10 Nov 1986. DOCUMENT TYPE:
 Patent CA Section: 49 (Industrial Inorganic Chemicals)
 In the title app., contg. a burner hood including a container at the upper
 end, a catalyst assembly extending perpendicular to the container
 length direction, and a tubular heat exchanger placed in the container
 for heating the residual gases, and extending in the container length
 direction and at its end held in a perforated plate, the catalyst assembly
 is supported by the ends of the tubes projecting from the upper
 perforated plate, the gases produced by the combustion flow from top
 to bottom, and the residual gas is heated by flowing perpendicularly
 through the combustion gas. Mounting of the catalyst assembly is
 improved.

Keywords

ammonia burner catalyst assembly support
 residual gas heating ammonia burner

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Burners

for ammonia, improved catalytic assembly and residual gas
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 Combustion catalysts
 improved support of, in ammonia combustion app.
 7664-41-7, reactions
 combustion of, catalytic, app. for, with improved catalytic assembly
 support and residual gas heating
 10102-43-9, preparation
 manuf. of, by ammonia catalytic combustion, app. for, improved
 catalytic assembly support and residual gas heating in

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114:215352

Stepwise assembly of charge-transfer complexes within zeolite
 supercages as visual probes for shape selectivity.
 Yoon, K. B.; Kochi, J. K. (Chem. Dep., Univ. Houston, Houston, TX
 77204-5641, USA). J. Phys. Chem., 95(9), 3780-90 (English) 1991.
 CODEN: JPCHAX. ISSN: 0022-3654. DOCUMENT TYPE: Journal
 CA Section: 66 (Surface Chemistry and Colloids) Section
 cross-reference(s): 22, 25, 67, 75, 78
 The shape-selective formation of various arom. charge-transfer
 complexes occurs within zeolite supercages doped with methylviologen

(MV2+) and other large mono- and dipyridinium acceptors. For example, ion exchange leads to a series of acceptor-doped zeolite Y such as MV(x)Y, typically with $x = 1$ and 2 MV2+ per supercage. Exposure of a hexane slurry of the colorless MVY to various substituted benzenes, naphthalenes, and anthracenes leads immediately to brilliant, distinctively colored yellow, orange, purple zeolites, while the supernatant soln. remains singularly colorless. The diffuse reflectance spectra of the colored zeolites show characteristic charge-transfer bands that are the same as those obtained in soln. with MV2+ and the corresponding arene. Thus, the successful isolation of the bright orange, single crystal of a naphthalene complex with MV2+ allows x-ray crystallog. to establish the relevant cofacial donor-acceptor arrangement within the zeolite cavity. Steric restrictions of the supercage are indicated in these zeolite expts. by the size and shape of the arene donor, all of the methylbenzenes including pentamethylbenzene rapidly forming brilliant yellow zeolites, the single striking exception being hexamethylbenzene. Shape selectivity is also indicated by the exclusion of 1,4-dimethoxynaphthalene (but not the 2,6-isomer) as well as 9-phenyl- and 9,10-dimethylantracene (but not 9-methylantracene). A van der Waals "width" of roughly 8 Å is sufficient to inhibit an arene from complex formation, and it represents the max. value for the kinetic diam. s of arenes in zeolite Y catalysis. Mass transport through zeolite Y was evaluated quant. by measuring the solvent effect on the rates of intercalation and extn. of various arene substrates.

Keywords

zeolite supercage charge transfer complex assembly
 viologen charge transfer complex assembly zeolite
 arom hydrocarbon charge transfer complex zeolite
 shape selectivity zeolite catalyst visual probe
 pyridinium acceptor reaction donor zeolite cavity

Index Entries

Zeolites, properties
 charge-transfer complex formation in supercages of, visual probes for
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 Aromatic hydrocarbons, reactions
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 Inclusion reaction
 of arom. hydrocarbons, in zeolite supercages, visual probe for
 Catalysts and Catalysis
 zeolite, charge-transfer complex visual probe for shape selectivity of
 2764-72-9
 4685-14-7
 13367-81-2
 21979-19-1
 33718-23-9
 charge-transfer complex formation by, with arom. hydrocarbons in zeolite supercage, shape selectivity in relation to
 2216-69-5
 5486-55-5
 10075-62-4
 18801-00-8
 133421-19-9
 71-43-2, reactions
 90-12-0
 91-20-3, reactions
 92-24-0
 95-93-2

104-93-8
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 108-67-8, reactions
 108-88-3, reactions
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 700-12-9
 779-02-2
 charge-transfer complex formation by, with pyridinium-type
 acceptor in zeolite supercage
 1335-30-4
 zeolites, charge-transfer complex formation in supercages of, visual
 probes for

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111:234606
 One-component rapid-setting siloxane adhesives for assembly of
 speakers.
 Naoki, Kei; Takagi, Yasuo (Cemedine Co., Ltd., Japan). Jpn. Kokai
 Tokyo Koho JP 01045486 A2 17 Feb 1989 Heisei, 4 pp. (Japan)
 CODEN: JKXXAF. CLASS: ICM: C09J003-16. ICS: H04R007-20;
 H04R007-22; H04R009-02; H04R009-04. APPLICATION: JP
 87-200838 13 Aug 1987. DOCUMENT TYPE: Patent CA Section: 38
 (Plastics Fabrication and Uses) Section cross-reference(s): 37
 The title compns. comprise polyethers bearing terminal $R_1nSi(R_2O)_3-n$
 ($R_1 = C_{1-12}$ hydrocarbyl; $R_2 = C_{1-6}$ hydrocarbyl; $n = 0-2$) groups, the
 silanes $Y a R_3 b Si(OR_4)_4-a-b$ [$R_3, R_4 = C_{1-4}$ hydrocarbyl; $Y =$ (substituted)
 hydrocarbyl; $a, b = 0-2$; $a + b = 0-2$], and silanol condensation catalysts.
 A mixt. of $Me(MeO)_2Si$ -terminated polyoxypropylene 100, PhMe 30,
 $CaCO_3$ 50, powd. SiO_2 5, $CH_2CHSi(OMe)_3$ 3, and Bu_2SnO 1 part
 cured in 20 min at 20° and 65% relative humidity when coated (300
 mm) on kraft paper. In bonding the cone and frame of a speaker, the
 adhesive set in 20 min at 20° and 65% relative humidity and the cone
 broke when pulled from the frame after 1 h.

Keywords

siloxane adhesive speaker cone
 polyoxyalkylene silyl ether adhesive
 condensation catalyst siloxane adhesive
 tin compd catalyst condensation
 vinyltrimethoxysilane siloxane adhesive

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Adhesives
 one-component, rapid-setting, silane-terminated polyethers and
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 Crosslinking catalysts
 organotin compds., for siloxane adhesives
 Polyoxyalkylenes, uses and miscellaneous
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 bonding of speaker cones
 Acoustic devices
 speakers, bonding of, adhesives for
 1760-24-3
 2768-02-7
 77396-40-8
 adhesives, for bonding of speaker cones
 818-08-6
 22673-19-4
 catalyst, for crosslinking of siloxane adhesives

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109:234009

Catalyst rejuvenation vessel assembly.

Tasker, Kenneth G.; Milligan, John D. (HRI Inc., USA). U.S. US 4769219 A 6 Sep 1988, 10 pp. (United States of America) CODEN: USXXAM. CLASS: ICM: F27B015-08. ICS: B01J038-00. NCL: 422144000. APPLICATION: US 87-36767 9 Apr 1987. DOCUMENT TYPE: Patent CA Section: 51 (Fossil Fuels, Derivatives, and Related Products)

A pressurizable vertically-oriented vessel assembly adapted for treating particulate spent oil-coated catalysts (e.g., from hydroprocessing) has inlet and outlet openings for the catalyst and washing liqs., and has a removable lower sub-assembly head portion which contains a conical-shaped grid unit. The vessel assembly is arranged to permit solvent washing, vacuum drying and acid treatment, and gas drying of the used catalyst in a bed supported above the conical grid, by upward flow and recycle of the washing liqs. and fluidization of the catalyst. Following rejuvenation of the catalyst, it is withdrawn from the vessel downwardly through the grid and out through a central withdrawal conduit contg. a slide valve unit for further processing or use as desired. The vessel assembly minimizes undesired catalyst attrition and expense resulting from the usual repeated handling of the catalyst in sep. vessels.

Keywords

hydroprocessing petroleum used catalyst rejuvenation

Index Entries

Petroleum refining catalysts

hydroprocessing, used, rejuvenation of, single vessel assembly for

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109:76502

Method for removing spent catalyst from a reactor tower and assembly for facilitating same.

Al-Saigh, Abbas (Alberta Energy Co. Ltd.; Canadian Occidental Petroleum Ltd.; Esso Resources Canada Ltd.; Gulf Canada Ltd., Can.). Can. CA 1235887 A1 3 May 1988, 13 pp. (Canada) CODEN: CAXXA4. CLASS: ICM: B01J008-04. APPLICATION: CA 85-477556 26 Mar 1985. DOCUMENT TYPE: Patent CA Section: 51 (Fossil Fuels, Derivatives, and Related Products)

A method and app. are described for permitting spent catalyst to be simultaneously vacuumed upward from the uppermost bed sections of a reactor tower (e.g., hydrotreater) and drained downward by gravity from the lowest bed sections. Porous removal baskets are seated in the upper ends of each of drain tubes of those interbed assemblies whose supported catalyst beds are to be vacuumed and delivered upwardly out of the tower. The baskets are each adapted to retain the column of catalyst above, to prevent the latter from draining downwardly into the next bed section; however, they are capable of permitting the reactant fluids moving in the reactor to pass therethrough.

Keywords

catalyst bed spent removal

hydrotreater catalyst bed vacuuming draining

Index Entries

Reactors

catalytic, with interbed assemblies, simultaneous vacuuming and

draining of spent catalysts in
 Petroleum refining
 hydroprocessing, reactor for, with interbed assemblies,
 simultaneous vacuuming and draining of bed in

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108:158869

Radiolytic method of preparation of semiconductor assemblies
 supported on polymeric membranes.

Haruvy, Y.; Gratzel, M.; Rajbenbach, L. A. (Dep. Radiat. Chem., Soreq
 Nucl. Res. Cent., Yavne 70600, Israel). Radiat. Phys. Chem., 31(4-6),
 843-52 (English) 1988. CODEN: RPCHDM. ISSN: 0146-5724.

DOCUMENT TYPE: Journal CA Section: 74 (Radiation Chemistry,
 Photochemistry, and Photographic and Other Reprographic
 Processes) Section cross-reference(s): 67

Radiation induced grafting of hydrophilic acrylic monomers onto
 polymeric films and fabric was used to prep. supports for catalytic
 assemblies, which are highly permeable to H₂O and low mol. wt.
 solutes. Transition-metal-oxide semiconductor clusters embedded
 within the grafted membranes were formed by swelling the membranes
 with a soln. of metal alkoxides followed by gradual hydrolysis.
 Photolytic methods were used to form Pt clusters on the
 semiconductor aggregates. Kinetic aspects of the radiation induced
 grafting of the polymeric supports and the mechanistic features of the
 prepn. of polymer-anchored TiO₂ clusters loaded with Pt are described.
 The photocatalytic effectiveness of the TiO₂-Pt assemblies embedded
 in recoverable polymeric grids was demonstrated in H₂ generation from
 aq. soln. and in the degrdn. of environmental pollutants.

Keywords

radiation grafting membrane semiconductor photocatalyst
 acrylic Nylon graft support catalyst

Index Entries

Electron beam, chemical and physical effects
 grafting of acrylic monomers onto polymeric films and fabrics, in
 prepn. of supports for photocatalytic assemblies
 Membranes
 nylon, radiolytic grafting of acrylic monomers to, in prepn. of
 supports for photocatalytic assemblies
 Photolysis catalysts
 titanium dioxide clusters supported on radiolytically grafted
 membranes, prepn. and characterization of
 Radiolysis
 electron, in grafting of polymeric films and fabrics, in prepn. of
 supports for semiconductor catalytic assemblies
 Polymerization
 graft, radiation-induced, in prepn. of support membranes for
 photocatalytic assemblies
 Catalysts and Catalysis
 photochem., semiconductor assemblies supported on polymeric
 membranes, radiolytic method of prepn. of
 13463-67-7, uses and miscellaneous
 photocatalysts from clusters of, embedded with radiolytically
 grafted membrane, prepn. and characterization of
 7440-06-4, uses and miscellaneous
 photocatalysts from titanium dioxide clusters embedded in
 radiolytically grafted membrane contg., prepn. and activity
 of
 106-48-9
 photocatalytic activity of titanium dioxide-radiolytically grafted
 membrane assembly in decompn. of

311-45-5
 photocatalytic decompn. of, using titanium dioxide/radiolytically
 grafted N-acrylamide fabric assembly
 1333-74-0, preparation
 photocatalytic generation from water, using titanium
 dioxide-radiolytically grafted membrane assemblies
 7732-18-5, reactions
 photocatalytic hydrogen generation from, using titanium
 dioxide-radiolytically grafted membrane assembly
 113718-76-6
 radiolytic prepn. of and characterization of, as support for platinized
 titanium dioxide clusters, for photocatalytic applications
 113693-61-1
 radiolytic prepn. of membrane of, for support for semiconductor
 photocatalysts
 107502-89-6
 radiolytical prepn. and characterization of, for application in
 photocatalytic assemblies

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113:137795
 Catalytic assembly for use in cleaning flue gas.
 Yamashita, Kazuo; Tabata, Kenji (Matsushita Electric Industrial Co.,
 Ltd., Japan). PCT Int. Appl. WO 9000088 A1 11 Jan 1990, 12 pp.
 DESIGNATED STATES: W: AU, GB, KR, US. (World Intellectual
 Property Organization) CODEN: PIXXD2. CLASS: ICM: B01J035-02.
 ICS: B01J035-04; B01D053-36. APPLICATION: WO 89-JP631 26
 Jun 1989. PRIORITY: JP 88-159982 28 Jun 1988; JP 88-160035 28
 Jun 1988. DOCUMENT TYPE: Patent CA Section: 59 (Air Pollution
 and Industrial Hygiene) Section cross-reference(s): 67
 An app. for treating flue gases from domestic or industrial furnaces
 comprises a catalyst supported on a conductive ceramic as the carrier,
 and means for controlling the ceramic temp. The conductive ceramic
 can be easily heated by energizing the flue gas and is effectively
 cleaned. The catalyst comprises Pt, Pd, Ru, Rh, Ni, Co, Cu, Cr, or
 perovskite-type composite oxides on γ -Al₂O₃ supports. The conductive
 ceramic is preferably made from a compd. having the structural formula
 (PbxAl_{1-x})TiO₃.aTiO₂, in which A is Cu or Sr; x is 0.7-1.0, a is 3-70. The
 app. is compact and can be operated at various temps.

Keywords

flue gas catalytic treatment app
 ceramic heater catalyst flue gas

Index Entries

Flue gases
 treatment of, catalytic app. for
 Catalysts and Catalysis
 supports, conductive ceramic heating layer as, for flue gas
 treatment
 7440-02-0, uses and miscellaneous
 7440-05-3, uses and miscellaneous
 7440-06-4, uses and miscellaneous
 7440-16-6, uses and miscellaneous
 7440-18-8, uses and miscellaneous
 7440-47-3, uses and miscellaneous
 7440-48-4, uses and miscellaneous
 7440-50-8, uses and miscellaneous
 123628-11-5
 catalyst, on conductive ceramic heating layer, for flue gas
 treatment

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113:25256

Pregellable functionalized liquid rubber adhesives.

Lanoye, Thierry; Garnault, Anne Marie (Henkel K.-G.a.A., Fed. Rep. Ger.). Eur. Pat. Appl. EP 356715 A1 7 Mar 1990, 17 pp.

DESIGNATED STATES: R: BE, DE, FR, GB, IT, NL, SE. (European Patent Organization) CODEN: EPXXDW. CLASS: ICM: C09J201-06.

ICS: C09J005-00; C08J003-24. APPLICATION: EP 89-113949 28

Jul 1989. PRIORITY: FR 88-10636 5 Aug 1988. DOCUMENT TYPE:

Patent CA Section: 38 (Plastics Fabrication and Uses) Section

cross-reference(s): 39

Liq. or brushable, vulcanizable adhesive compns. contain 30-70 parts unsatd. rubber bearing an av. of 2 OH groups/mol., 30-70 parts compatible rubber bearing 2 CO₂H and/or anhydride groups/mol., 10-120 phr vulcanizing agent, and optionally other additives and 0.01-5 phr transesterification catalyst, 1 polymer being vulcanizable. Mixts. of OH group-contg. polybutadiene (mol. wt. 3000, OH no. 48 mg KOH/g) 43.9, anhydride-treated polybutadiene (mol. wt. 1700, acid no. 150) 43.5, antioxidant 2.5, and filler 110.1 parts contg. 0, 0.4, 0.8, 1.3, and 1.6% Bu₂NH (transesterification catalyst) had gelation times several days and 24, 7, 4, and 2 min, resp. A similar compn. contg. 10.3 parts vulcanizing agent bonded steel with tensile shear strength 16 daN/cm² when cured 25 min at 170°.

Keywords

adhesive gelation rubber blend
carboxylated butadiene rubber adhesive
hydroxylated butadiene rubber adhesive
butadiene rubber functional adhesive
catalyst gelation rubber adhesive
butylamine catalyst gelation adhesive

Index Entries

Amines, uses and miscellaneous

catalysts, for pregelation of carboxylated and hydroxylated rubber mixts. for adhesives

Adhesives

liq., thermosetting, pregellable, carboxylated and hydroxylated unsatd. rubber blends, contg. esterification catalysts and vulcanizing agents

Vulcanization

room-temp., partial, of mixed carboxy- and hydroxy-contg. liq. rubbers in adhesive compns. for ease of assembly

98-94-2

102-69-2

109-02-4

111-92-2

121-44-8, uses and miscellaneous

124-40-3, uses and miscellaneous

catalysts, for pregelation of carboxylated and hydroxylated rubber mixts. for adhesives

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110:11031

Hydrogen-air fuel cells of the alkaline matrix type: development of components.

Staschewski, D. (Inst. Neutron Phys. React. Tech., Karlsruhe Nucl. Res. Cent., Karlsruhe, Fed. Rep. Ger.). Int. J. Hydrogen Energy, 13(10), 633-8 (English) 1988. CODEN: IJHEDX. ISSN: 0360-3199.

DOCUMENT TYPE: Journal CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section

cross-reference(s): 38, 57, 72

The fabrication is described of double-screen edge-contacted electrodes for alk. H-air fuel cells; the assembly consists of 2 ceramic filter plates encircled by a silicone rubber gasket and covered with polyester spacers, Ni screens sepd. by electrolyte, and Al-PTFE plates.

The assembly is galvanized for 2.5 h at 16 A to form a metallic matrix which contains the Pt/carbon black catalyst. The monocells assembled are routinely tested to evaluate safety, component functions, dynamic current-voltage characteristics, and gas flow response of the matrix system.

Keywords

hydrogen air fuel cell development
electrode screen nickel fuel cell
platinum catalyst galvanized matrix electrode

Index Entries

Carbon black, uses and miscellaneous
in electrode screen matrix, for alk. fuel cells
Galvanization
of double screen assembly, in electrode matrix manuf., for alk. fuel cells
Electrolytic polarization
of double-screen matrix electrode, for alk. fuel cells
Fuel cells
alk., hydrogen-air, matrix-type, component development and testing for
Ceramic materials and wares
filters, in electrode screen matrix, for alk. fuel cells
Electrodes
fuel-cell, matrix type, fabrication of, for alk. fuel cells
7440-06-4, uses and miscellaneous
catalysts, on carbon black, in screen matrix electrode, for alk. fuel cell
7440-02-0, uses and miscellaneous
electrode screens of, manuf. of, matrix galvanization in, for alk. fuel cells
7440-66-6, unspecified
galvanization, of double screen assembly, in electrode matrix manuf., for alk. fuel cells
9002-84-0
in screen electrode matrix, for alk. fuel cells
7429-90-5, uses and miscellaneous
plates, in electrode screen matrix, for alk. fuel cells

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115:232660

Novel class of asymmetric zwitterionic rotaxanes based on α -cyclodextrin.

Isnin, Rahimah; Kaifer, Angel E. (Chem. Dep., Univ. Miami, Coral Gables, FL 33124, USA). J. Am. Chem. Soc., 113(21), 8188-90 (English) 1991. CODEN: JACSAT. ISSN: 0002-7863. DOCUMENT TYPE: Journal CA Section: 33 (Carbohydrates)

The synthesis and properties of a new class of asym. rotaxanes, e.g. I ($n = 7, 11$), are described. These rotaxanes are made from mols. having an alkyl chain flanked by dimethyl(ferrocenylmethyl)ammonium and carboxylic acid groups. Complexation of the alkyl chain by α -cyclodextrin followed by reaction of the carboxylic acid with a bulky amine results in the trapping of the cyclodextrin, threaded by the alkyl chain, thus generating the rotaxane structure. The asym. nature of these mols. leads to the observation of isomerism due to the two possible orientations of the threaded cyclodextrin receptors.

Keywords

asym zwitterionic rotaxane synthesis properties
cyclodextrin conversion rotaxane
carboxylic acid group rotaxane
ferrocenylmethyldimethylammonium group rotaxane

Index Entries

Zwitterionic compounds
asym. rotaxanes, prepn. of, from [(dimethylamino)methyl]ferrocene,
aminonaphthalenesulfonate, and α -cyclodextrin
Rotaxanes
asym. zwitterionic, prepn. of, from
[(dimethylamino)methyl]ferrocene,
aminonaphthalenesulfonate, and α -cyclodextrin
7084-11-9
catalyst for assembly of rotaxanes
136236-65-2
formation of, during prepn. of asym. rotaxane
119-79-9
potassium salt formation of
16618-95-4
prepn. and reaction of, with α -cyclodextrin and
[dimethyl(ferrocenylmethyl)]alkane-carboxylic acid
136236-63-0
136236-64-1
prepn. and reaction of, with α -cyclodextrin and
aminonaphthalenesulfonate
136236-66-3
136236-68-5
prepn. of, as asym. rotaxane
17696-11-6
73367-80-3
reaction of, with [(dimethylamino)methyl]ferrocene
10016-20-3
reaction of, with aminonaphthalenesulfonate and
[dimethyl(ferrocenylmethyl)]alkane-carboxylic acid
1271-86-9
reaction of, with bromoalkane-carboxylic acid

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115:104861

Application of the oxidative properties of hydrogen peroxide to an FIA
spectrophotometry assembly.

Martinez Calatayud, J.; Sagrado Vives, S.; Sanmiguel Roche, F. (Dep.
Quim., Col. Univ. CEU, Moncada, Spain). Quim. Anal. (Barcelona),
9(3), 281-7 (English) 1990. CODEN: QUANEL. ISSN: 0212-0569.

DOCUMENT TYPE: Journal CA Section: 79 (Inorganic Analytical
Chemistry)

A simple, inexpensive device for the decompn. of H₂O₂ into water and
O by means of a catalytic pyrolusite minicolumn was developed. The
device allows the exploration of the oxidative properties of H₂O₂ in a
continuous flow assembly provided with a spectrophotometric detector
to avoid both the blocking of the UV region by the remaining H₂O₂ and
customary tedious, interfering O bubbles in the whole UV-V area.

Keywords

hydrogen peroxide decompn flow injection spectrophotometry

Index Entries

Decomposition catalysts
for hydrogen peroxide in flow injection spectrophotometry
Spectrochemical analysis
spectrophotometric, flow injection, device for decompn. hydrogen
peroxide in
1317-37-9
7439-89-6, uses and miscellaneous
7440-50-8, uses and miscellaneous
7782-42-5, uses and miscellaneous
11110-87-5
14854-26-3
decompn. catalyst, for hydrogen peroxide in flow injection
spectrophotometry
7722-84-1, reactions
decompn. of, in flow injection spectrophotometric anal., app. for

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113:238719

Assembly of molecules in zeolite.
Ichikawa, Masaru; Fukuoka, Atsushi (Catal. Res. Cent., Hokkaido
Univ., Sapporo 060, Japan). Kagaku (Kyoto), 45(8), 540-1 (English)
1990. CODEN: KAKYAU. ISSN: 0451-1964. DOCUMENT TYPE:
Journal; General Review CA Section: 67 (Catalysis, Reaction Kinetics,
and Inorganic Reaction Mechanisms)
A review with 5 refs., on the prepn. and catalytic functions of bimetallic
carbonyl clusters in zeolite.

Keywords

review bimetallic carbonyl cluster zeolite catalyst

Index Entries

Catalysts and Catalysis
bimetallic carbonyl clusters supported on zeolites, prepn. and
activity of
Cluster compounds, coordinative
bimetallic carbonyl, catalysts from zeolite-supported, prepn. and
activity of
Carbonyls
bimetallic clusters, catalysts from zeolite-supported, prepn. and
activity of
Zeolites, uses and miscellaneous
catalysts from bimetallic carbonyl clusters and, prepn. and activity
of
630-08-0, unspecified
carbonyls, bimetallic clusters, catalysts from zeolite-supported,
prepn. and activity of
1335-30-4
zeolites, catalysts from bimetallic carbonyl clusters and, prepn. and
activity of

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113:58216

Decarboxylation of 6-nitrobenzisoazole-3-carboxylate ion in surfactant
self assemblies.
Germani, Raimondo; Ponti, Pier Paolo; Savelli, Gianfranco; Spreti,
Nicoletta; Cipiciani, Antonio; Cerichelli, Giorgio; Bunton, Clifford A.
(Dip. Chim., Ing. Chim. Mater., Univ. L'Aquila, L'Aquila 67100, Italy). J.
Chem. Soc., Perkin Trans. 2, (11), 1767-71 (English) 1989. CODEN:
JCPKBH. ISSN: 0300-9580. DOCUMENT TYPE: Journal CA Section:
22 (Physical Organic Chemistry)
Decarboxylation of the 6-nitrobenzisoazole-3-carboxylate ion is

speeded more by small assemblies of didodecyl(dimethyl)ammonium chloride (DDDACl) than by fully formed assemblies or by normal cationic micelles. The first-order rate consts., k_1M , of reaction of fully micelle-bound substrate increase with decreasing surface charge d. of normal cationic micelles with a change from hydrophilic to less hydrophilic counter-ions, e.g., in going from CTAOH to CTAOTos (CTA = $C_{16}H_{33}NMe_3$ and Tos = tosyl), or from cationic to zwitterionic micelles.

These changes are ascribed to changes in transfer free energies of the initial-state carboxylate ion and the charge-delocalized transition state so that small assemblies of cationic amphiphiles, e.g., of DDDA or $(C_{8}H_{17})_3N^+R$, are better catalysts than cationic micelles because of less initial-state stabilization. A similar explanation can be applied to catalysis of decarboxylation by synthetic cationic vesicles.

Keywords

decarboxylation kinetics mechanism nitrobenzisoxazolecarboxylate
surfactant catalyst

Index Entries

Liposome

Micelles

effect of, on decarboxylation of nitrobenzisoxazolecarboxylate

Surfactants

effect of, on decarboxylation of nitrobenzisoxazolecarboxylates

Transition state structure

for decarboxylation of nitrobenzisoxazolecarboxylate in small

surfactant self-assemblies

Kinetics of decarboxylation

of nitrobenzisoxazolecarboxylate in presence of surfactants

Decarboxylation

of nitrobenzisoxazolecarboxylate, mechanism in relation to

surfactant self-assembly effects on

Molecular association

of surfactants, decarboxylation of nitrobenzisoxazolecarboxylate in

relation to

Free energy

transfer, of carboxylates, surfactant effects on decarboxylation in

relation to

42540-91-0

decarboxylation of, small surfactant self-assemblies in relation to

kinetics and mechanism of

57-09-0

112-02-7

505-86-2

693-33-4

79054-30-1

effect of, on decarboxylation of nitrobenzisoxazole carboxylate,

kinetics and mechanism with

138-32-9

683-10-3

2601-33-4

3401-74-9

24705-21-3

54385-45-4

67355-36-6

effect of, on decarboxylation of nitrobenzisoxazolecarboxylate,

kinetics and mechanism with

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112:218341

Adhesives for polycarbonate head light assemblies.

(Kendall Co., USA). Jpn. Kokai Tokkyo Koho JP 01271409 A2 30 Oct

1989 Heisei, 12 pp. (Japan) CODEN: JKXXAF. CLASS: ICM:
C08F299-00. ICS: C08J005-12; C09J003-14. APPLICATION: JP
88-100055 22 Apr 1988. DOCUMENT TYPE: Patent CA Section: 38
(Plastics Fabrication and Uses) Section cross-reference(s): 39
Visible light-curable adhesive contain '1 polyfunctional acrylic
monomer, elastomers, polyfunctional aliph. urethane acrylates, and
photoinitiators. Thus, an adhesive contained Hycar 4051 CG 19.0,
1,6-hexanediol diacrylate 68.8, ethoxyethoxyethyl acrylate 10.0,
camphorquinone 0.2, and N,N-dimethylaminoethyl methacrylate 2.0%.

Keywords

polycarbonate head light assembly
adhesive rubber acrylate catalyst
visible light curable adhesive

Index Entries

Polycarbonates, uses and miscellaneous
head light assemblies, adhesives for, visible light-curable
Electric lamps
head light assemblies, polycarbonates for, adhesive for, visible
light-curable
Adhesives
visible light-curable, contg. rubber and acrylates and catalysts, for
polycarbonate head light assemblies
Polymerization catalysts
photochem., camphor quinones and dimethylaminoethyl
methacrylate, for adhesives for polycarbonate head light
assemblies
126758-11-0
adhesives, contg. acrylic rubber, visible light-curable, for
polycarbonate in light assemblies
83995-58-8
adhesives, contg. chlorosulfonated polyethylene, visible
light-curable, for polycarbonate head light assemblies
126758-12-1
126758-13-2
126895-56-5
adhesives, visible light-curable, for polycarbonate head light
assemblies
2867-47-2
catalysts, contg. camphorquinone, for visible light-curable adhesive
for polycarbonate head light assemblies
465-29-2
catalysts, contg. dimethylaminoethyl methacrylate, for visible
light-curable adhesives for polycarbonate head light
assemblies

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109:63119

Irreversible self-assembly of monomolecular layers of a cobalt(II)
hexadecyltetrapyrrolylporphyrin amphiphile at gold electrodes and
its catalysis of oxygen reduction.
Van Galen, Dean A.; Majda, Marcin (Dep. Chem., Univ. California,
Berkeley, CA 94720, USA). Anal. Chem., 60(15), 1549-53 (English)
1988. CODEN: ANCHAM. ISSN: 0003-2700. DOCUMENT TYPE:
Journal CA Section: 72 (Electrochemistry) Section cross-reference(s):
66, 67
An amphiphilic Co(II)-tetrapyrrolylporphyrin deriv. (Cl6CoTPyP) was
synthesized and its adsorption by Au from acidic aq. electrolytes was
studied by a spectrophotometric assay. A limiting coverage of $(86 \pm 0.6) \times 10^{-11}$ mol/cm² was detd. and interpreted based on the pressure
vs surface area isotherms from a Langmuir trough, as a close-packed

monolayer of the porphyrin rings oriented parallel to the electrode surface. A hydrophobic layer consisting of the hexadecyl chains of the amphiphile is formed between the adsorbed porphyrin in moieties and the electrolyte soln. The presence of this hydrophobic region induces the obsd. irreversibility of the C15CoTPyP adsorption by hindering the kinetics of the adsorption/desorption processes. The nonamphiphilic analogs of C16CoTPyP do not adsorb under the same conditions. Rotating disk electrode measurements revealed full catalytic activity of the adsorbed amphiphile in the electroredn. of O to H₂O₂. A rate const. of ca. $1 \times 10^5 \text{ M}^{-1} \text{ s}^{-1}$ was obtained, in agreement with the literature data for other cobalt-porphyrin deriv. adsorbed at electrodes.

Keywords

cobalt tetrapyrrolylporphyrin adsorption gold
Langmuir isotherm porphyrin cobalt deriv
kinetics irreversibility adsorption complex
redn catalyst cobalt complex oxygen

Index Entries

Reduction catalysts
cobalt-porphyrin derivs., for oxygen
Optical absorption
of cobalt-porphyrin deriv.
Adsorption kinetics
of cobalt-porphyrin deriv. on gold, electrode catalytic properties in relation to
Adsorption
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Reduction, electrochemical
of oxygen, on gold electrode, cobalt-porphyrin deriv. adsorption effect on
7440-57-5, properties
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79346-65-9
adsorption of, by gold electrode, electrocatalytic properties in relation to
114763-57-4
adsorption of, by gold, electrode catalytic properties to oxygen in relation to
7722-84-1, preparation
formation of, during electrocatalytic redn. of oxygen on gold electrode coated with cobalt-porphyrin derivs.
7782-44-7, reactions
redn. of, electrocatalytic, cobalt-porphyrin deriv. effect on

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106:57624

New photocathode materials for hydrogen evolution: calcium iron oxide (CaFe₂O₄) and strontium iron oxide (Sr₇Fe₁₀O₂₂).
Matsumoto, Yasumichi; Omae, Masaru; Sugiyama, Kazuyoshi; Sato, Eiichi (Fac. Eng., Utsunomiya Univ., Utsunomiya 321, Japan). J. Phys. Chem., 91(3), 577-81 (English) 1987. CODEN: JPCHAX. ISSN: 0022-3654. DOCUMENT TYPE: Journal CA Section: 72
(Electrochemistry) Section cross-reference(s): 67, 76
The photoelectrochem. properties of p-type CaFe₂O₄ and Sr₇Fe₁₀O₂₂ were studied in N-satd. 0.25M K₂SO₄ (pH 6.0). The differences between the Fermi level and the top of the valence band were detd. to be 0.14 and 0.4 eV for Sr₇Fe₁₀O₂₂ and CaFe₂O₄, resp., from the activation energies of the conductivities and the Seebeck coeffs. The

cathodic photocurrents of the H evoln. were obsd. in the potential region more pos. than reversible H electrode by 0.7-0.8 V. The band gaps were 1.8 and 1.9 eV for Sr7Fe10O22 and CaFe2O4, resp. The flat band potential of Sr7Fe10O22 is 0.1 V vs. SCE, but that of CaFe2O4 could not be detd. because of the Fermi level pinning. Pt deposited on the surfaces of the both electrodes accelerates the electrochem. evolution of CaFe2O4 is more stable than Sr7Fe10O22 in the long-term test. The short-circuit photocurrent of 0.3-0.4 mA/cm2 was obsd. in a Pt-deposited CaFe2O4 (p type)/Zn1.2Fe1.8O4 (n type) assembly under a Xe lamp illumination. The band structures of Sr7Fe10O22 and CaFe2O4 and their photoelectrochem. processes are also discussed.

Keywords

cathode photoelectrochem hydrogen evolution
calcium ferrate cathode photoelectrochem property
strontium ferrate cathode photoelectrochem property
ferrate calcium strontium photoelectrochem property
photoelectrochem property calcium strontium ferrate
flatband potential strontium ferrate
platinum catalyst hydrogen evolution photocathode
band structure calcium strontium ferrate

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Electric conductivity and conduction
Seebeck effect, of calcium ferrate and strontium ferrate
Electric impedance
Photoconductivity and Photoconduction
of calcium ferrate and strontium ferrate
Electric current-potential relationship
of calcium ferrate and strontium ferrate in potassium sulfate soln.
Energy level, band structure
of calcium ferrate and strontium ferrate, photoelectrochem.
processes in relation to
Reduction catalysts
photoelectrochem., platinum, with calcium ferrate or strontium
ferrate for hydrogen evolution
Electric capacitance
potential relations with, of strontium ferrate
Thermoelectricity
Seebeck effect, of calcium ferrate and strontium ferrate
Electric potential
flatband, of strontium ferrate
Cathodes
photoelectrochem., calcium ferrate and strontium ferrate, for
hydrogen evolution
7440-06-4, uses and miscellaneous
catalysts, for electrochem. evolution of hydrogen on calcium ferrate
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12346-10-0
cathode, photoelectrochem., for hydrogen evolution, platinum
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1333-74-0, preparation
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105500-77-4
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7778-80-5, uses and miscellaneous
photoelectrochem. properties of calcium ferrate and strontium
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7732-18-5, reactions
photoelectrolysis of, calcium ferrate and strontium ferrate cathodes

for

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122:171151

A 'smart' catalyst that self-assembles under turnover conditions. Hill, Craig L.; Zhang, Xuan (Dept. of Chemistry, Emory University, Atlanta, GA 30322, USA). Nature (London), 373(6512), 324-6 (English) 1995. CODEN: NATUAS. ISSN: 0028-0836. DOCUMENT TYPE: Journal CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms) Section cross-reference(s): 23, 45 Virtually all synthetic materials with a dynamic function, from catalysts to integrated circuit elements, degree irreversibly with time. The inevitability of decay is an implicit consideration in the design of materials or mols. that serve these functions, and fabrication methods tend to aim simply at minimizing the rate of decay. Here, by contrast, we describe a mol. catalyst that experiences a thermodyn. and kinetic driving force for its own reassembly and repair under the conditions of catalysis. We show that the multicomponent polyanion cluster $a-[(CoII)PW_{11}O_{39}]^{5-}$ self-assembles from four precursor species, contg. a total of 28 mols., and that as it assembles it starts simultaneously to catalyze the epoxidn. of alkenes with high selectivity. This conclusion follows from the observation that the kinetics of self-assembly and those of catalysis are closely correlated as the reactions proceed. Should it be fragmented during operation, this polyanion catalyst will therefore experience a thermodyn. and kinetic driving force for its own repair.

Keywords

smart catalyst self assembly turnover condition
olefin epoxidn smart catalyst self assembly
heteropoly acid smart catalyst olefin epoxidn

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Heteropoly acids
Alkenes, reactions
epoxidn.; 'smart' catalyst that self-assembles under turnover conditions
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for alkenes; 'smart' catalyst that self-assembles under turnover conditions
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Kinetics, reaction
'smart' catalyst that self-assembles under turnover conditions
536-80-1
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645-49-8
286-20-4
822-67-3
epoxidn.; 'smart' catalyst that self-assembles under turnover conditions
61504-31-2
7440-48-4, reactions
12408-02-5, reactions
14066-20-7, unspecified
14311-52-5
22541-53-3, reactions
'smart' catalyst that self-assembles under turnover conditions

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121:164824

Role of the material of the cell assembly during thermal decomposition of zinc oxalate.

Majumdar, R.; Mukhopadhyay, Mutka Roy; Sarkar, P. (Department Chemical Technology, Calcutta Univ., Calcutta 700009, India). Proc. Natl. Symp. Therm. Anal., 9th, 403-6. Edited by: Ravindran, P. V. Indian Therm. Anal. Soc.: Bombay, India. (English) 1993. CODEN: 60IMAI. DOCUMENT TYPE: Conference CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms) Section cross-reference(s): 69

Platinum, the most common material of sample cells and/or thermocouples (that are sometimes embedded in sample) used in thermal anal., acts as catalyst for oxidn. of carbon monoxide evolved during decompn. of zinc oxalate; ZnO does not play any catalytic role as has been believed so far.

Keywords

platinum catalyst carbon monoxide oxidn DTA
TG platinum catalyst carbon monoxide oxidn
thermogravimetry platinum catalyst carbon monoxide oxidn
thermal decompn kinetics zinc oxalate

Index Entries

Oxidation

of evolved carbon monoxide, by platinum in thermal anal. cell during zinc oxalate thermal decompn.

Kinetics of thermal decomposition

Thermal decomposition

of zinc oxalate, role of material of cell assembly during

Thermogravimetric analysis

platinum in cell assembly as catalyst for evolved carbon monoxide oxidn. in zinc oxalate thermal decompn.

Oxidation catalysts

platinum, in thermal anal. cell, for carbon monoxide evolved in zinc oxalate thermal decompn.

Thermal analysis

differential, platinum in cell assembly as catalyst for evolved carbon monoxide oxidn. in zinc oxalate thermal decompn.

7440-06-4, uses

catalyst, for oxidn. of evolved carbon monoxide in thermal anal. cell in zinc oxalate thermal decompn.

630-08-0, reactions

oxidn. of evolved, by platinum in thermal anal. cell during zinc oxalate thermal decompn.

547-68-2

thermal decompn. kinetics of, role of material of cell assembly during

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123:203158

Liquid-phase catalyst assembly for vapor-liq. distillation towers.

Gentry, Joseph Charles (Glitsch, Inc., USA). Eur. Pat. Appl. EP 670178 A2 6 Sep 1995, 9 pp. DESIGNATED STATES: R: BE, DE,

ES, FR, GB, IT. (European Patent Organization). CODEN: EPXXDW.

CLASS: ICM: B01J008-02. ICS: B01J008-00; B01D003-00.

APPLICATION: EP 95-301335 2 Mar 1995. PRIORITY: US 94-206748

4 Mar 1994. DOCUMENT TYPE: Patent CA Section: 47 (Apparatus and Plant Equipment)

The catalyst media for chem. reaction is provided in the liq. phase of the tower, such as in the lower portion for improving mass transfer efficiency. The arrangement confines the reaction step to the liq.

phase. The reaction is less obstructive to vapor flow in the tower, promoting better mixing and diffusion of the feed components.

Keywords

catalyst system vapor liq distn tower

Index Entries

Reactors

catalytic, distn. columns; liq.-phase catalyst assembly for vapor-liq. distn. towers

Distillation apparatus

column, liq.-phase catalyst assembly for vapor-liq. distn. towers

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123:181202

Three Tritium Systems Test Assembly (TSTA) off-loop experiments.

Talcott, C. L.; Anderson, J. L.; Carlson, R. V.; Coffin, D. O.; Walthers, C. R.; Hamerdinger, D.; Binning, K.; Trujillo, R. D.; Moya, J. S.; et al.

(Tritium Science and Technology Group, Los Alamos National Laboratory, Los Alamos, NM 87545, USA). IEEE/NPSS Symp. Fusion Eng., Volume Date 1993, 15th (Vol. 1), 198-203 (English) 1994.

CODEN: INSFEI. ISSN: 1078-8891. DOCUMENT TYPE: Journal CA

Section: 71 (Nuclear Technology)

The first expt. involved two O-ring valve seals each of Viton-A, Buna-N, and EDPM exposed to 1, 40, or 400 torr of tritium while being cycled open and closed approx. 11,500 times in 192 days. EDPM was the least susceptible to damage. Both Buna-N and Viton-A showed deterioration following the first cycling at 400 torr. In a second expt., using com. available materials, a portable water removal unit to reduce tritium oxide emissions during glove-box breaches was designed and built. The unit removed 99.9% of all tritium and saved between 0.7 and 3.5 Ci of tritium oxide from being stacked during each of five tests. As a third expt., a series of tests were performed to det. whether the presence of SF₆ changed the ability of Pd and Pt to catalyze the T₂-O₂ reaction to form T₂O. No deterioration of the catalytic activity was obsd.

Keywords

Tritium Systems Test Assembly offloop expt

Index Entries

Glove boxes

Tritium Systems Test Assembly portable water removal unit to reduce tritium oxide emissions during glove-box breaches

Valves

Rubber, synthetic

Rubber, nitrile, uses

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Seals (mechanical)

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Rubber, synthetic

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Three Tritium Systems Test Assembly off-loop expts.

14940-65-9

Three Tritium Systems Test Assembly off-loop expts. in relation to

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 9003-18-3
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 cycling in TSTA off-loop expts.

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125:231527

Layer-by-Layer Growth of Electrostatically Assembled Multilayer
 Porphyrin Films.

Araki, Koiti; Wagner, Michael J.; Wrighton, Mark S. (Massachusetts
 Institute of Technology, Cambridge, MA 02139, USA). Langmuir,
 12(22), 5393-5398 (English) 1996. CODEN: LANGD5. ISSN:
 0743-7463. DOCUMENT TYPE: Journal CA Section: 66 (Surface
 Chemistry and Colloids) Section cross-reference(s): 36, 72, 73, 74
 The feasibility of prepg. multilayer porphyrin films with monolayer
 control of compn. and thickness is demonstrated. Successive
 dip-coating of tetraruthenated Zn porphyrin ([ZnTPyPBpy]⁴⁺) and
 meso-tetraphenylporphyrin sulfonate ([M-TPPS]⁴⁻) is shown to result in
 linear growth of the film thickness (12.7(6) Å/bilayer) and optical
 absorbance as a function of the no. of bilayers. These results strongly
 suggest a layer-by-layer assembly of compositionally homogeneous
 films of \approx 30 bilayers. The assembled multilayer composite films were
 characterized by UV-visible spectroscopy, SEM, XPS, AFM, and
 electrochem. methods. Electrodes modified with these films exhibit a
 reversible wave at 0.94 V and are photocatalytically active toward the
 redn. of O₂. These results suggest that the layer-by-layer growth
 method may be a general route to compositionally modulated porphyrin
 films of arbitrary thickness and rationally tailored catalytic and
 photophys. properties.

Keywords

porphyrin multilayer film electrostatic assembly spectra
 oxygen redn porphyrin film photoelectrochem catalyst
 ruthenated zinc porphyrin multilayer dip coating

Index Entries

Reduction catalysts
 for oxygen; porphyrin multilayer film electrostatic assembly and
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 Ion pairs
 Ultraviolet and visible spectra
 Porphyrins
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 Coating process
 dip, porphyrin multilayer film assembly and characterization
 180888-37-3
 39050-26-5
 67204-03-9
 161537-04-8
 7782-44-7, reactions
 porphyrin multilayer film electrostatic assembly and
 characterization

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124:110290

Assembly of a ribonucleoprotein catalyst by tertiary structure capture.
Weeks, Kevin M.; Cech, Thomas R. (Univ. Colorado, Howard Hughes
Med. Inst., Boulder, CO 80309-0215, USA). Science (Washington, D.
C.), 271(5247), 345-8 (English) 1996. CODEN: SCIEAS. ISSN:
0036-8075. DOCUMENT TYPE: Journal CA Section: 6 (General
Biochemistry)

CBP2 is an RNA tertiary structure binding protein required for efficient
splicing of a yeast mitochondrial group I intron. CBP2 must wait for
folding of the two RNA domains that make up the catalytic core before
it can bind. In a subsequent step, assocn. of the 5' domain of the RNA
is stabilized by addnl. interactions with the protein. Thus, CBP2
functions primarily to capture otherwise transient RNA tertiary
structures. This simple one-RNA, one-protein system has revealed
how the kinetic pathway of RNA folding can direct the assembly of a
specific ribonucleoprotein complex. There are parallels to steps in the
formation of a much more complex ribonucleoprotein, the 30S
ribosomal subunit.

Keywords

ribonucleoprotein CBP2 RNA tertiary structure

Index Entries

Ribonucleic acid formation factors

CBP2 (cytochrome b pre-mRNA-processing factor, 2); assembly
of yeast splicing factor CBP2 ribonucleoprotein by RNA
tertiary structure capture

Mitochondria

Yeast

Ribonucleic acids

assembly of yeast splicing factor CBP2 ribonucleoprotein by RNA
tertiary structure capture

Conformation and Conformers

folding; assembly of yeast splicing factor CBP2 ribonucleoprotein
by RNA tertiary structure capture

Conformation and Conformers

tertiary, assembly of yeast splicing factor CBP2 ribonucleoprotein
by RNA tertiary structure capture

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123:94348

Assembly of acid and sintering resistant honeycomb washcoat and
catalytically active phase using sols of silica, zirconia, and platinum.
Felthouse, T. R.; Berkel, D. A.; Jost, S. R.; McGrew, E. L.; Vavere, A.
(Monsanto Enviro-Chem Systems, Inc., St. Louis, MO 63167, USA).
Prepr. - Am. Chem. Soc., Div. Pet. Chem., 40(1), 32-6 (English) 1995.
CODEN: ACPCAT. ISSN: 0569-3799. DOCUMENT TYPE: Journal

CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction
Mechanisms) Section cross-reference(s): 59, 66

This work describes development of high performance honeycomb
catalysts for SO₂ oxidn. having platinum as the active phase. Novel
techniques were developed for washcoat and active phase loadings
which serve as models for how other metal oxide particles related to
silica can be loaded onto a honeycomb substrates. Those techniques
are reported along with comparative reactor data. Thermal and chem.
aging studies demonstrate superiority of these newly developed
Pt-honeycomb catalysts for activity maintenance. Use of electron
microscopy and auxiliary techniques to define the Pt-promoter-support
structure provides a consistent picture that accounts for the high
activity, thermal stability, and acid resistance.

Keywords

platinum silica zirconia catalyst
sulfur oxide oxidn platinum catalyst

Index Entries

Oxidation catalysts

for sulfur dioxide; assembly of acid and sintering resistant
honeycomb washcoat and catalytically active phase using
sols of silica, zirconia, and platinum
1314-23-4, uses
7440-06-4, uses
7631-86-9, uses
assembly of acid and sintering resistant honeycomb washcoat
and catalytically active phase using sols of silica, zirconia,
and platinum
7446-09-5, reactions
oxidn. of; assembly of acid and sintering resistant honeycomb
washcoat and catalytically active phase using sols of silica,
zirconia, and platinum

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122:116054

Self-assembly of polyoxometalate conjugates: novel models for
catalytic surfaces from crystal data.
Lowe, Mark P.; Lockhart, Joyce C.; Forsyth, George A.; Clegg, William;
Fraser, Kelly A. (Dep. Chem., Univ. Newcastle, Newcastle upon Tyne
NE1 7RU, UK). J. Chem. Soc., Dalton Trans., (1), 145-52 (English)
1995. CODEN: JCOTBI. ISSN: 0300-9246. DOCUMENT TYPE:
Journal CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic
Reaction Mechanisms) Section cross-reference(s): 75, 78
Self-assembly of new org. conjugates of the
pentamolybdodiphosphonato cage with cyclic
aminomethylphosphonates has been achieved. The crystal structures
of two of the conjugates have been detd. and all of them characterized
by IR spectroscopy. Intramol. hydrogen bonding of the aminomethyl
moiety to cage oxygen and close intermol. C-H...O-Mo contacts
(between 2.3 and 2.5 Å for the H...O distance) are obsd., providing a
new model for the interaction of substrates with a polyoxometalate
catalytic surface. A scheme for modeling the
pentamolybdodiphosphonato cage with a distance-restraint-based
model is presented.

Keywords

self assembly polyoxometalate conjugate catalyst model
crystal structure polyoxometalate conjugate

Index Entries

Crystal structure

Molecular structure

of polyoxometalate conjugates

Catalysts and Catalysis

Hydrogen bond

self-assembly of polyoxometalate conjugates and novel models for
catalytic surfaces from crystal data

160896-12-8

160896-14-0

crystal structure; self-assembly of polyoxometalate conjugates and
novel models for catalytic surfaces from crystal data

160896-15-1

160896-16-2

160896-18-4

self-assembly of polyoxometalate conjugates and novel models for

catalytic surfaces from crystal data

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124:202464

Coupled Organolanthanide-Catalyzed C-N/C-C Bond Formation Processes. Efficient Regiospecific Assembly of Pyrrolizidine and Indolizidine Skeletons in a Single Catalytic Reaction.

Li, Yanwu; Marks, Tobin J. (Department of Chemistry, Northwestern University, Evanston, IL 60208-3113, USA). J. Am. Chem. Soc., 118(3), 707-8 (English) 1996. CODEN: JACSAT. ISSN: 0002-7863.

DOCUMENT TYPE: Journal CA Section: 29 (Organometallic and Organometalloidal Compounds) Section cross-reference(s): 22, 27

Organolanthanide complexes $\text{Cp}'_2\text{LnCH}(\text{TMS})_2$ and $\text{Me}_2\text{SiCp}'_2\text{LnCH}(\text{TMS})_2$ ($\text{Cp}' = \eta^5\text{-Me}_5\text{C}_5$; $\text{Cp}'' = \eta^5\text{-Me}_4\text{C}_5$; Ln = lanthanide) serve as precatalysts for the efficient regiospecific bicyclization of substrates of the structure $\text{RCYC}(\text{CH}_2)\text{aNH}(\text{CH}_2)\text{bCYCR}$, $\text{RCYC}(\text{CH}_2)\text{cNH}-(\text{CH}_2)\text{dCH}:\text{CH}_2$, and $\text{H}_2\text{C}:\text{CH}(\text{CH}_2)\text{eNH}(\text{CH}_2)\text{fCH}:\text{CH}_2$ to the corresponding pyrrolizidine and indolizidine skeletons. E.g., bicyclization of $\text{MeCYC}(\text{CH}_2)_3\text{NHCH}_2\text{CH}:\text{CH}_2$ in C_6H_6 in presence of $\text{Cp}'_2\text{SmCH}(\text{TMS})_2$ gave 75% pyrrolizidine I. Turnover frequencies vary from 2 to 777 h^{-1} at 21° , and isolated product yields from 68-93%. In the case of $e = 3$, $f = 1$, the reaction kinetics are zero-order in substrate concn. and first-order in $\text{Cp}'_2\text{Sm}$ concn. In the case of $R = \text{Ph}$, $c = 3$, $d = 1$, $\text{Cp}'_2\text{Ln}$ -catalyzed turnover frequencies fall precipitously with decreasing Ln+3 ionic radius. The results implicate a turnover-limiting alkene/alkyne insertion step with, in most cases, CYC insertion into the Ln-N functionality occurring first.

Keywords

pyrrolizidine skeleton prepn
indolizidine skeleton prepn
regiospecific bicyclization organolanthanide catalyst
alkadiene amino regiospecific bicyclization organolanthanide catalyst
alkadiyne amino regiospecific bicyclization organolanthanide catalyst
alkenyne amino regiospecific bicyclization organolanthanide catalyst

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Alkadienes
Alkadiynes
Alkynes
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Kinetics of cycloaddition reaction
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 174148-47-1
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 98720-37-7
 54436-57-6
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 174148-36-8
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 174148-38-0
 66333-59-3
 66333-60-6
 132256-96-3
 174148-39-1
 174148-40-4
 174148-41-5
 174148-42-6
 174148-43-7
 regiospecific bicyclization of aminoalkadienes, -alkadiynes, and
 -alkenynes in presence of organolanthanide complexes

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123:340243

A convenient molecular self-assembly route to thin films containing terminal donor ligands and anchored organotransition-metal complexes for heterogenized homogeneous catalysis.

Petrucchi, Maria G. L.; Kakkar, Ashok K. (Dep. Chem., McGill Univ., Montreal, PQ H3A 2K6, Can.). J. Chem. Soc., Chem. Commun., (15), 1577-8 (English) 1995. CODEN: JCCCAT. ISSN: 0022-4936.

DOCUMENT TYPE: Journal CA Section: 29 (Organometallic and Organometalloidal Compounds) Section cross-reference(s): 25, 57, 67, 78

Simple acid-base hydrolytic chem. on the surfaces of glass, quartz or Si provides an easy access to thin films contg. terminal amine and phosphine donor ligands which covalently bind a variety of organometallic complexes, and such oriented ultrathin films supporting a densely packed Ni(0) organometallic complex on glass, catalyze oligomerization of phenylacetylene.

Keywords

anchored nickel rhodium amine phosphine complex
 glass anchored nickel rhodium complex catalyst
 quartz anchored nickel rhodium complex catalyst
 silica anchored nickel rhodium complex catalyst
 oligomerization phenylacetylene anchored metal complex
 benzene triphenyl
 safety prepn anchored metal complexes

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 Polymerization
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7440-21-3, reaction products with

14808-60-7, reaction products with

536-74-3

2360-09-0

5068-21-3

13007-90-4

14523-22-9

14694-95-2

996-50-9

170646-76-1

170646-77-2

612-71-5

1165-53-3

170646-78-3

170646-79-4

convenient mol. self-assembly route to thin films contg. terminal

donor ligands and anchored organotransition-metal

complexes for heterogenized homogeneous catalysis

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121:143969

Ion exchange membrane/electrode assembly having increased

efficiency in proton exchange processes.

Eisman, Glenn A.; Door, Robert D. (Dow Chemical Co., USA). U.S.

US 5302269 A 12 Apr 1994, 10 pp. Cont.-in-part of U.S. Ser. No.

536,146, abandoned. (United States of America). CODEN: USXXAM.

CLASS: ICM: C25B009-00. NCL: 204252000. APPLICATION: US

91-722712 27 Jun 1991. PRIORITY: US 90-536146 11 Jun 1990.

DOCUMENT TYPE: Patent CA Section: 72 (Electrochemistry) Section

cross-reference(s): 38, 49, 52, 66

An ion exchange membrane/electrode assembly having increased

efficiency in proton exchange processes as the result of membrane

hydration processing comprising heating a membrane/electrode

assembly at elevated temp. and pressure so as to provide increased

hydration levels of the membrane.

Keywords

ion exchange membrane electrode assembly

hydrogen exchange ion exchange membrane electrode

fuel cell ion exchange membrane electrode

water electrolysis ion exchange membrane electrode

Index Entries

Fuel cells

ion exchange membrane for, for increased efficiency in hydrogen

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29514-94-1, polymers

80974-95-4, polymers

157160-39-9, polymers

ion exchange membrane, with electrode, for water electrolytic cells and fuel cells, increased efficiency in proton exchange processes

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120:109001

Adhesive films having a crosslinkable polymer layer and a crosslinking catalyst layer.

Emori, Kenji; Ishii, Shigeyoshi (Minnesota Mining and Mfg. Co., USA).

PCT Int. Appl. WO 9305122 A1 18 Mar 1993, 26 pp. DESIGNATED

STATES: W: KR; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU,

MC, NL, SE. (World Intellectual Property Organization). CODEN:

PIXXD2. CLASS: ICM: C09J007-00. ICS: C09J179-06.

APPLICATION: WO 92-US6366 31 Jul 1992. PRIORITY: US

91-757727 11 Sep 1991. DOCUMENT TYPE: Patent CA Section: 38

(Plastics Fabrication and Uses) Section cross-reference(s): 76

Rapid-curing, storage-stable adhesive films, useful in manuf. of printed circuit assemblies, have a main layer contg. a crosslinkable cyanate ester resin of mol. wt. 150-2000 and a thermoplastic resin with mol. wt. 3000-200,000 and a catalyst layer contg. curing agents selected from organometallic compds., metal chelates, and/or org. metal salts and a thermoplastic resin with mol. wt. 3000-200,000, so that the total amt. of thermoplastic resin in both layers is 10-300 parts/100 parts cyanate ester resin. A typical adhesive film comprised a 20-mm layer of a 1:1 (wt. ratio) Arocy B30 [2,2-bis(4-cyanatophenyl)propane polymer]-Slec BBX1 [poly(vinyl butyral)] blend and a 5-mm layer of a 100:5 (wt. ratio) Slec BBX1-cyclopentadienyl iron dicarbonyl dimer mixt.

Keywords

polyvinyl butyral biscyanatophenylpropane homopolymer adhesive film
metal chelate crosslinking catalyst adhesive
cyclopentadienyl iron dicarbonyl dimer catalyst adhesive
storage stable layered adhesive film
printed circuit assembly layered adhesive film
rapid curing layered adhesive film
cyanate ester resin adhesive film

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Urethane polymers, uses

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Adhesive tapes

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Vinyl acetal polymers

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Polyesters, uses

Siloxanes and Silicones, uses

polyimide-, crosslinkable cyanate ester resin blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of printed circuit assemblies

Electric circuits

printed, assemblies, adhesive films for manuf. of, storage-stable rapid-curing, contg. crosslinkable polymer layer and crosslinking catalyst layer

Phenolic resins, uses

resol, crosslinkable cyanate ester resin blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of printed circuit assemblies

Polycarbonates, uses

Polyimides, uses

siloxane-, crosslinkable cyanate ester resin blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of printed circuit assemblies

10170-69-1

12154-95-9

15321-51-4

21679-46-9

catalysts, for crosslinking multilayer storage-stable adhesive films contg. cyanate ester resins and thermoplastic resins, for manuf. of printed circuit assemblies

9003-35-4

25068-38-6

25135-51-7

112024-92-7

crosslinkable cyanate ester resin blends with, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of printed circuit assemblies

25722-66-1

101657-78-7

101657-80-1

120026-65-5

resin blends with, multilayer crosslinkable adhesive films contg., storage-stable rapid-curing, for manuf. of printed circuit assemblies

106107-54-4

rubber, hydrogenated, block, triblock, maleated, crosslinkable cyanate ester resin blends with Tuftec M1913, multilayer adhesive films contg., storage-stable rapid-curing, for manuf. of printed circuit assemblies

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125:91313

Membrane-electrode assembly for a direct methanol fuel cell.

Kosek, John A.; Cropley, Cecelia C.; Laconti, Anthony B. (Giner, Inc., USA). U.S. US 5523177 A 4 Jun 1996, 12 pp. (United States of America). CODEN: USXXAM. CLASS: ICM: H01M004-92. ICS:

H01M004-86. NCL: 429040000. APPLICATION: US 94-322110 12

Oct 1994. DOCUMENT TYPE: Patent CA Section: 52

(Electrochemical, Radiational, and Thermal Energy Technology)

A direct methanol fuel cell (DMFC) contains a membrane electrode assembly (MEA) including an anode porous electrode structure which can operate on a liq. or vapor methanol/water feed in the absence of a liq. electrolyte such as sulfuric acid, a proton-exchange membrane electrolyte, and a porous gas-diffusion cathode. The anode porous electrode structure includes a three-dimensional reduced (Pt--Ru)Ox catalyst particle-ionomer composite structure, whereby the ionomer coats the individual particles and provides a mechanism for continuous proton transport throughout the composite structure, eliminating the need for a liq. acidic electrolyte. The partially reduced (Pt--Ru)Ox particles are individually ionomer coated prior to anode fabrication. The anode porous electrode structure is subsequently bonded to one side of a thin sheet of a solid proton-conducting ionomer membrane and a cathode structure bonded to the opposite side of the membrane, to form a MEA. Insertion of the MEA into appropriate hardware results in fuel cell fabrication.

Keywords

platinum ruthenium oxide fuel cell
direct methanol fuel cell

Index Entries

Fuel cells

membrane-electrode assembly for a direct methanol fuel cell

174068-76-9

catalyst, composite with ionomer, in porous anode structure for direct methanol fuel cell

12613-88-6

in prepn. of platinum ruthenium oxide particles for composite

porous anode structure for direct methanol fuel cell

67-56-1, uses

membrane-electrode assembly for a direct methanol fuel cell

66796-30-3

solubilized, in composite anode structure contg. platinum ruthenium oxide particles, for direct methanol fuel cell

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124:261603

Poly(A×A×U) triple helix formation promoted by porphyrin assembly.
Lauceri, Rosaria; Campagna, Tiziana; Contino, Annalinda; Purrello, Roberto (Dipartimento Scienze Chimiche, Università Catania, Catania I-95125, Italy). Angew. Chem., Int. Ed. Engl., 35(2), 215-16 (English) 1996. CODEN: ACIEAY. ISSN: 0570-0833. DOCUMENT TYPE: Journal CA Section: 33 (Carbohydrates) Section cross-reference(s): 6
A multicomponent mol. recognition process leads to a self-assembled "quaternary" supramol. complex formed from porphyrins and an "unusual" poly(A×A×U) triple helix. The formation of this super-structure is promoted by porphyrin aggregation and a no. of recognition processes (Watson-Crick and Hoogsteen pairing, coulombic interactions, and stacking interactions).

Keywords

RNA triplex prepn catalyst porphyrin

Index Entries

Ribonucleic acids

prepn. of RNA triplex promoted by porphyrin assembly

38673-65-3

40603-58-5

48242-70-2

119708-09-7

24937-83-5

27416-86-0

24936-34-3

24936-38-7

62355-54-8

prepn. of RNA triplex promoted by porphyrin assembly

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123:212554

Catalytic apparatus for carbon dioxide regeneration and nitrogen oxide removal at room temperature in carbon dioxide lasers.

Cheng, Zuhai; Chen, Tao (Huazhong Science and Engineering University, Peop. Rep. China). Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1089063 A 6 Jul 1994, 7 pp. (People's Republic of China). CODEN: CNXXEV. CLASS: ICM: H01S003-02. ICS: H01S003-036. APPLICATION: CN 93-108105 2 Jul 1993.

DOCUMENT TYPE: Patent CA Section: 73 (Optical, Electron, and Mass Spectroscopy and Other Related Properties) Section cross-reference(s): 67

The title app. consists of a metal shell and a filter net assembly which comprises several nets with catalysts loosely packed between them.

Keywords

carbon dioxide laser regeneration catalyst assembly

nitrogen oxide elimination catalyst assembly

Index Entries

Catalysts and Catalysis

Lasers

catalytic app. for carbon dioxide regeneration and nitrogen oxide removal at room temp. in carbon dioxide lasers

124-38-9, uses

11104-93-1, processes

catalytic app. for carbon dioxide regeneration and nitrogen oxide removal at room temp. in carbon dioxide lasers

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122:254476

Self-assembly of mono- and dinuclear metal complexes; oxidation catalysis and metalloenzyme models.

Feringa, Ben L.; Gelling, Onko-Jan; Rispen, Minze T.; Lubben, Marcel (Groningen Center Catalysis and Synthesis, University Groningen, Groningen 9747 AG, Neth.). NATO ASI Ser., Ser. C, 448 171-90 (English) 1994. CODEN: NSCSDW. ISSN: 0258-2023. DOCUMENT

TYPE: Journal; General Review CA Section: 78 (Inorganic Chemicals and Reactions) Section cross-reference(s): 7, 67

A review, with 60 refs. In this chapter several approaches to achieve assembly of mono- and dinuclear metal complexes, which can be considered structural and functional models for metalloenzymes, are described. The emphasis lies on oxidn. chem., summarizing O₂ binding, hydroxylation, demethylation, dehalogenation and dehydrogenation. Also self-assembly of chiral mono- and dinuclear complexes is illustrated.

Keywords

dioxygen binding metalloenzyme model review
hydroxylation metalloenzyme model review
demethylation metalloenzyme model review
dehalogenation metalloenzyme model review
dehydrogenation metalloenzyme model review
review metalloenzyme model
enzyme metallo model review
catalyst oxidn metalloenzyme model review

Index Entries

Oxidation catalysts
metalloenzyme models
Dehalogenation
Dehydrogenation
Demethylation
Hydroxylation
of metalloenzyme models
Enzyme functional sites
self-assembly of mono- and dinuclear metal complexes; oxidn.
catalysis and metalloenzyme models
Transition metal compounds
complexes, self-assembly of mono- and dinuclear metal
complexes; oxidn. catalysis and metalloenzyme models
7782-44-7, reactions
binding by metalloenzyme models

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122:173945

Supramolecular semiconductor receptor assemblies: improved electron transfer at TiO₂-b-cyclodextrin colloid interfaces. Willner, I.; Eichen, Y.; Willner, B. (Institute of Chemistry, Hebrew University of Jerusalem, Jerusalem 91904, Israel). Res. Chem. Intermed., 20(7), 681-700 (English) 1994. CODEN: RCINEE. ISSN: 0922-6168. DOCUMENT TYPE: Journal CA Section: 74 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Semiconductor TiO₂-colloids are stabilized by b-cyclodextrin (b-CD). Photoinduced electron transfer at the semiconductor soln. interface is controlled in the semiconductor-receptor assembly TiO₂-b-CD. Trapping of TiO₂-b-CD photoexcited conduction-band electrons by N,N'-dioctyl-4,4'-bipyridinium, C₈V₂⁺, is 4.4 fold more effective than by

N,N'-dimethyl-4,4'-bipyridinium. The kinetics of C8V2+ redn., inhibition expts. and laser flash photolysis studies reveal that the effective trapping of conduction-band electrons by C8V2+ originates from its assocn. to the b-CD receptor. Electron transfer from dye, proflavine, to the semiconductor, is similarly controlled by the semiconductor-receptor assembly. In the presence of the Pt modified semiconductor-receptor colloid, Pt-TiO2-b-CD, effective photoinduced H2-evolution occurs using proflavine as photosensitizer. Inhibition expts. and flow-dialysis measurements indicate that the effective H2-evolution originates from the assocn. of proflavine to the b-CD receptor sites.

Keywords

photoinduced electron transfer titania cyclodextrin photocatalyst
 photolysis hydrogen photoprodn titania cyclodextrin photocatalyst
 supramol semiconductor receptor assembly electron phototransfer
 water photolysis titania interface electron transfer
 colloid titania cyclodextrin receptor water photocatalyst

Index Entries

Adsorption

adsorption isotherm of b-cyclodextrin on colloidal titania for
 improved electron transfer at photocatalyst interface for
 hydrogen generation from water

Photolysis catalysts

improved electron transfer at titania-b-cyclodextrin colloid
 photocatalyst interface for hydrogen generation from water

Reduction, photochemical

of viologen acceptors in electron transfer at titania-b-cyclodextrin
 colloid photocatalyst interface for hydrogen prodn.

Electron exchange catalysts

photochem.; improved electron transfer at titania-b-cyclodextrin
 colloid photocatalyst interface for hydrogen generation from
 water

Photolysis

flash, in study of improved electron transfer at titania-b-cyclodextrin
 colloid photocatalyst interface

Electron exchange and Charge transfer

photochem., improved electron transfer at titania-b-cyclodextrin
 colloid photocatalyst interface

13463-67-7, processes

colloidal; cyclodextrin stabilized colloidal titania photocatalyst for
 improved electron transfer at catalyst interface for

hydrogen generation

7585-39-9

7732-18-5, processes

cyclodextrin stabilized colloidal titania photocatalyst for improved
 electron transfer at catalyst interface for hydrogen

generation

4685-14-7

66620-94-8

electron acceptor; improved electron transfer at
 titania-b-cyclodextrin colloid photocatalyst interface for
 hydrogen prodn.

1333-74-0, processes

improved electron transfer at titania-b-cyclodextrin colloid
 photocatalyst interface for hydrogen prodn.

7440-06-4, uses

improvement of photoinduced electron injection to semiconductor
 in platinum-titania-cyclodextrin colloid photocatalyst for
 water photolysis system

87922-26-7

improvement of photoinduced electron transfer at

titania-cyclodextrin colloid photocatalyst interface to octyl
viologen acceptor
7550-45-0, reactions
in prepn. of cyclodextrin stabilized colloidal titania photocatalyst for
improved electron transfer at catalyst interface for
hydrogen generation
108-95-2, processes
2534-66-9
photoinduced interfacial electron transfer at titania-cyclodextrin
colloid photocatalyst affected by
92-62-6
photosensitizer; improved electron transfer at titania-b-cyclodextrin
colloid photocatalyst interface for hydrogen prodn.
52-90-4, uses
sacrificial electron donor; improvement of photoinduced electron
injection at titania-cyclodextrin colloid photocatalyst
interface in water photolysis system contg.
67-63-0, uses
sacrificial electron donor; improvement of photoinduced electron
transfer at titania-cyclodextrin colloid photocatalyst interface
to acceptor in water photolysis system contg.

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117:171175

One-pot synthesis and redox properties of conjugation-extended
4,4'-bipyridines and related compounds. New ligands consisting of
a heterocyclic three-ring assembly.
Takahashi, Kazuko; Nihira, Takayasu (Fac. Sci., Tohoku Univ., Sendai
980, Japan). Bull. Chem. Soc. Jpn., 65(7), 1855-9 (English) 1992.
CODEN: BCSJA8. ISSN: 0009-2673. DOCUMENT TYPE: Journal
CA Section: 27 (Heterocyclic Compounds (One Hetero Atom))

Dipyridyl-substituted heterocycles such as 2,5-di(4-pyridyl)thiophene (I),
2,5-di(4-pyridyl)furan (II), 2,5-di(4-pyridyl)thieno[3,2-b]thiophene (III),
1,4-di(4-pyridyl)benzene, 2,5-di(2-pyridyl)thiophene, and
2,5-di(3-pyridyl)thiophene have been efficiently synthesized by a simple
one-pot procedure through the palladium-mediated cross-coupling
reaction between (trimethylstannyl)pyridines and dibromo-substituted
heteroaroms. The spectroscopic data (IR, ¹H NMR, ¹³C NMR, UV) as
well as their redn. potentials of these compds. have been detd. to
evaluate the utility potentials to chelating ligands for metal complexes or
to synthetic precursors of viologen-type bipyridinium salts. The
conjugation interaction throughout the three rings appears to be more
significant in I and II than in III. The formation of stable radical anions
and dianions of I and II has been proved by cyclic voltammetry.

Keywords

stannylpyridine dibromothiophene coupling palladium catalyst
dibromofuran stannylpyridine coupling palladium catalyst
dibromobenzene stannylpyridine coupling palladium catalyst
dipyridylthiophene prepn redox potential
dipyridylfuran prepn redox potential
thiophene dipyridyl
furan dipyridyl

Index Entries

Coupling reaction
of stannylpyridines with dibromothiophene, dibromofuran and
dibromobenzene
Coupling reaction catalysts
palladium, for stannylpyridines with dibromothiophene,
dibromofuran and dibromobenzene

13737-05-8
 59020-09-6
 81128-26-9
 palladium-mediated coupling reaction of, with dibromothiophene
 59020-06-3
 palladium-mediated coupling reaction of, with dibromothiophene,
 dibromofuran, and dibromobenzene
 106-37-6
 3141-27-3
 25121-87-3
 32460-00-7
 palladium-mediated coupling reaction of, with stannylpyridines
 141511-42-4
 141700-75-6
 prepn. and redox potential of
 1665-30-1
 35299-68-4
 113682-56-7
 143724-44-1
 143724-45-2
 prepn. of

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117:47951
 The first catalytic iron-mediated [4 + 1] cyclopentenone assembly:
 stereoselective synthesis of 2,5-dialkylidenecyclo-3-pentenones.
 Eaton, Bruce E.; Rollman, Brent; Kaduk, James A. (Dep. Chem.,
 Washington State Univ., Pullman, WA 99164, USA). J. Am. Chem.
 Soc., 114(15), 6245-6 (English) 1992. CODEN: JACSAT. ISSN:
 0002-7863. DOCUMENT TYPE: Journal CA Section: 24 (Alicyclic
 Compounds)
 Conjugated diallenes undergo stereoselective [4+1] cycloaddn. with
 CO in the presence of Fe(CO)₅ or Fe₂(CO)₉ in THF. Consistent with
 the 1st step being rate-limiting coordination of Fe to the diallene, CO
 was inhibitory. Facial selectivity of Fe coordination may account for
 why meso diallenes gave highly stereoselective alkylidene C:C bond
 formation to yield only sym. 2,5-dialkylidene-3-cyclopentenones.

Keywords

cycloaddn carbon monoxide diallene catalyst
 iron carbonyl catalyst cycloaddn diallene
 cyclopentenone dialkylidene

Index Entries

Cycloaddition reaction catalysts
 [4+1], iron carbonyls, for diallenes with carbon monoxide
 Cycloaddition reaction
 [4+1], of diallenes with carbon monoxide,
 dialkylidenecyclopentenones by catalytic
 Alkadienes
 allenic, di-, cycloaddn. reaction of, with carbon monoxide, catalysts
 for
 13463-40-6
 15321-51-4
 catalyst, for cycloaddn. of diallenes with carbon monoxide
 3642-20-4
 42525-51-9
 42525-52-0
 142184-24-5
 cycloaddn. reaction of, with carbon monoxide, catalysts for
 630-08-0, reactions
 cycloaddn. reaction of, with diallenes, catalysts for

142066-34-0
142066-35-1
142066-36-2
142066-37-3
prepn. of

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116:42828

Adhesives for assembly of polycarbonate moldings.

Eppinger, Bernhard; Krahmer, Melanie (Heraeus Kulzer G.m.b.H., Germany). Eur. Pat. Appl. EP 452540 A1 23 Oct 1991, 7 pp.

DESIGNATED STATES: R: DE, FR, GB. (European Patent Organization). CODEN: EPXXDW. CLASS: ICM: C09J133-00.

APPLICATION: EP 90-119713 15 Oct 1990. PRIORITY: DE

90-4012720 21 Apr 1990. DOCUMENT TYPE: Patent CA Section: 38

(Plastics Fabrication and Uses)

The title adhesives, resistant to H₂O and fuels and useful at -35° to +85°, comprise cold-curing mixts. of compns. contg. alkyl methacrylates 5-50, polymethacrylates 1-60, PMMA 1-60, and org. peroxides 0.5-5% with similar compns. contg. amines in place of peroxides. A mixt. of 60% Me methacrylate soln. of PMMA 78, bisphenol A bis[2-(methacryloyloxy)ethyl] ether 20, and Bz2O2 2% and a similar mixt. contg. 2% p-MeC6H4NMe2 in place of Bz2O2 were combined and used to bond polycarbonate moldings. The joints failed by fracture in the polycarbonate after 20 cycles of 30 min in boiling H₂O and 1 h at -35°; 10 h in boiling H₂O; or 5 h in gasoline or diesel oil at 80°.

Keywords

adhesive bonding polycarbonate molding
PMMA adhesive bonding polycarbonate
methacrylate adhesive bonding polycarbonate
bisphenol A ether methacrylate adhesive
peroxide catalyst crosslinking adhesive
amine catalyst crosslinking adhesive
catalyst crosslinking adhesive polycarbonate

Index Entries

Polycarbonates, miscellaneous

bonding of, polymethacrylate adhesives for, resistant to temp.

cycling, fuels and water

Peroxides, uses

catalysts, for crosslinking of methacrylate polymer adhesives

Crosslinking catalysts

peroxides and dimethyltoluidine, for polymethacrylate adhesives for

bonding of polycarbonates

Adhesives

polymethacrylates, for bonding of polycarbonates, resistant to

temp. cycling, fuels and water

25777-71-3

28931-67-1

55527-51-0

adhesives for bonding of polycarbonates, resistant to temp. cycling,

water and fuels

94-36-0, uses

99-97-8

catalysts, for crosslinking of methacrylate polymer adhesives

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124:92621

Multilayer electrode for solid-electrolyte fuel cells and an assembly of this electrode with polymer electrolyte.

Kato, Hiroshi (Japan Gore Tex Inc, Japan). Jpn. Kokai Tokkyo Koho JP 07296818 A2 10 Nov 1995 Heisei, 6 pp. (Japan). CODEN: JKXXAF. CLASS: ICM: H01M004-86. ICS: H01M004-88; H01M004-92; H01M008-02; H01M008-10. APPLICATION: JP 94-84797 22 Apr 1994. DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology)
The title electrode consists of a 1st layer contg. elec. conductive particles (esp., carbon black) and PTFE and a 2nd layer contg. catalyst-supporting particles (esp., carbon black powder supporting Pt) and a solid polymer electrolyte. The 2nd layer partially penetrates in the 1st layer.

Keywords

solid electrolyte fuel cell multilayer electrode

Index Entries

Carbon black, uses
in multilayer electrode for solid-electrolyte fuel cells
Fuel cells
solid-state, multilayer electrode for solid-electrolyte fuel cells and assembly of this electrode with polymer electrolyte
7440-06-4, uses
catalyst, in multilayer electrode for solid-electrolyte fuel cells
9002-84-0
in multilayer electrode for solid-electrolyte fuel cells

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117:111177

Asymmetric multipoint control by diastereo-differentiative assembly of three components with palladium catalyst.
Torii, Sigeru; Okumoto, Hiroshi; Ozaki, Harutoshi; Nakayasu, Seizo; Tadokoro, Tadashi; Kotani, Takayuki (Fac. Eng., Okayama Univ., Tsushima 700, Japan). Tetrahedron Lett., 33(24), 3499-502 (English) 1992. CODEN: TELEAY. ISSN: 0040-4039. DOCUMENT TYPE: Journal CA Section: 24 (Alicyclic Compounds)

Palladium-catalyzed diastereo-differentiative tandem connection of cis-alkenyl iodide I (R = Me₃CSiMe₂), norbornene and its homologs, and cyano nucleophiles accompanying isomerization of the cis-olefin to trans was executed, where the diastereotopic face and olefinic carbons of norbornene were discriminated to give 2,3-disubstituted norbornanes, e.g., II.

Keywords

diastereodifferentiative octenyl iodide norbornene cyanide addn
norbornane disubstituted chiral
palladium catalyzed stereoselective addn

Index Entries

Stereochemistry
of addn. reaction of octenyl iodide with norbornenes and potassium cyanide
Isomerization
of octenyl iodide in addn. reaction with norbornene and potassium cyanide, stereoselectivity in relation to
Addition reaction
stereoselective, of octenyl iodide with norbornenes and potassium cyanide
Addition reaction catalysts
stereoselective, palladium diacetate, for octenyl iodide with

norbornenes and potassium cyanide
 3375-31-3
 catalyst, for stereoselective addn. of octenyl iodide with
 norbornenes and potassium cyanide
 139683-96-8
 142507-57-1
 143088-07-7
 143088-08-8
 143088-09-9
 143088-10-2
 143088-11-3
 143088-12-4
 143168-42-7
 prepn. of
 41138-67-4
 122873-06-7
 143168-90-5
 stereoselective addn. reaction of, with norbornenes and potassium
 cyanide
 121-46-0
 498-66-8
 931-64-6
 143088-13-5
 stereoselective addn. reaction of, with octenyl iodide and
 potassium cyanide

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125:276542
 Rapid assembly of "subtiligase" substrates to elucidate optimal
 ligation junctures.
 Judice, J. Kevin; Namenuk, Angela K.; Burnier, John P. (Dep. Bioorg.
 Chem., Genentech Inc., South San Francisco, CA 94080, USA).
 Bioorg. Med. Chem. Lett., 6(16), 1961-1966 (English) 1996. CODEN:
 BMCLE8. ISSN: 0960-894X. DOCUMENT TYPE: Journal CA
 Section: 34 (Amino Acids, Peptides, and Proteins) Section
 cross-reference(s): 9
 A method allowing for the rapid selection of optimal ligation junctures
 for the enzyme "subtiligase" is described. To expedite prodn. of the
 glycolate ester substrate peptides for subtiligase, we have modified the
 protocols for compatibility with Fmoc chem. The utility of this approach
 is demonstrated in a model system.

Keywords

subtiligase catalyst peptide coupling

Index Entries

Peptides, preparation
 subtiligase catalyzed peptide coupling in elucidation of optimal
 ligation junctures
 182623-32-1
 13831-30-6
 35661-40-6
 68858-20-8
 71989-16-7
 71989-20-3
 73724-45-5
 121343-82-6
 135248-89-4
 136337-10-5
 182623-25-2
 182623-26-3
 182623-27-4

182623-28-5
 182623-29-6
 182623-30-9
 182623-11-6, resin-bound
 182623-12-7, resin-bound
 182623-13-8, resin-bound
 182623-14-9, resin-bound
 182623-15-0, resin-bound
 182623-16-1, resin-bound
 182623-17-2, resin-bound
 182623-18-3
 182623-19-4
 182623-20-7
 182623-21-8
 182623-22-9
 182623-23-0
 182623-24-1
 subtiligase catalyzed peptide coupling in elucidation of optimal
 ligation junctures
 9014-01-1
 subtiligase; subtiligase catalyzed peptide coupling in elucidation of
 optimal ligation junctures

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125:87419
 Design of functional polymers for use in "smart" catalysis and self
 assembly (modified polymers).
 Mariagnanam, Vimala Mary (Texas A and M Univ., College Station, TX,
 USA). 207 pp. Avail. Univ. Microfilms Int., Order No. DA9615844
 From: Diss. Abstr. Int., B 1996, 57(1), 370 (English) 1995.
 DOCUMENT TYPE: Dissertation CA Section: 35 (Chemistry of
 Synthetic High Polymers)
 Abstract Unavailable

Keywords

bromination polypropylene smart catalyst

Index Entries

Bromination catalysts
 Polyoxyalkylenes, uses
 bromination of polypropylene by smart catalysts
 9003-07-0
 bromination of polypropylene by smart catalysts
 106392-12-5
 triblock; bromination of polypropylene by smart catalysts

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124:268982
 Manufacture of a metal support for a catalytic converter under vacuum.
 Wieres, Ludwig (Emitec Gesellschaft fuer Emissionstechnologie Mbh,
 Germany). Ger. Offen. DE 4432730 A1 21 Mar 1996, 7 pp. (Germany).
 CODEN: GWXXBX. CLASS: ICM: B23K031-00. ICS: B23P013-00;
 B21D047-00; F01N003-26; B01J037-08; B21D053-88. ICA:
 B01D053-86; B01J035-04. APPLICATION: DE 94-4432730 14 Sep
 1994. DOCUMENT TYPE: Patent CA Section: 59 (Air Pollution and
 Industrial Hygiene) Section cross-reference(s): 67
 The honeycomb catalyst support is cleaned and assembled under
 vacuum; this enables a higher throughput and is more energy-sparing
 than traditional methods.

Keywords

catalyst support assembly vacuum

Index Entries

Catalysts and Catalysis

manuf. of a metal support for a catalytic converter under vacuum

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122:22449

Metallosupramolecular assembly of dinuclear double helicates incorporating a biphenyl-3,3'-diyl spacer; Molecular structure of bis(3,3'-bis[4-(methylsulfanyl)-2,2'-bipyridin-6-yl]biphenyl-c2N,N':c2N',N'')dicopper(I) hexafluorophosphate.

Constable, Edwin C.; Hannon, Michael J.; Edwards, Andrew J.; Raithby, Paul R. (Inst. Anorgan. Chem., Basel CH-4056, Switz.). J. Chem. Soc., Dalton Trans., (18), 2669-77 (English) 1994. CODEN: JCOTBI. ISSN: 0300-9246. DOCUMENT TYPE: Journal CA Section: 78 (Inorganic Chemicals and Reactions) Section cross-reference(s): 27, 75

Linking two 2,2'-bipyridine metal-binding domains by a biphenyl-3,3'-diyl spacer provided a new type of helicand, I (L), which has been shown to form dinuclear double-helical complexes with a range of transition-metal ions. The copper(I) complex [Cu₂L₂](PF₆)₂ has been structurally characterized [orthorhombic, space group Pba₂, a = 23.023(5), b = 23.206(5), c = 12.224(2) Å, Z = 4, wR₂ = 0.259 for all data]. These complexes show increased intermetallic sepns. with respect to analogous complexes formed with ligands in which the metal-binding domains are directly linked or are connected by a 1,3-phenylene spacer. This provides an addnl. level of control in the deliberate design of mols. contg. helical motifs. Stacking interactions do not appear to be of importance in the stabilization of these helical structures. The biphenyl spacer does not appear to be sufficiently flexible to permit the formation of triple-helical complexes.

Keywords

crystal structure copper dinuclear bipyridinylbiphenyl thioether
double helix copper dinuclear bipyridinylbiphenyl thioether
transition metal complex bipyridinylbiphenyl thioether

Index Entries

Transition metals, preparation

bis(bipyridinyl)biphenyl thioether complexes

Crystal structure

Molecular structure

Quaternary structure

of copper dinuclear complex with bis(bipyridinyl)biphenyl thioether deriv.

78570-34-0

for prepn. of bis(bipyridinyl)biphenyl thioether

14264-16-5

for prepn. of catalyst for prepn. of diacetylbiophenyl

64443-05-6

for prepn. of copper dinuclear bis(bipyridinyl)biphenyl thioether complex

2142-63-4

for prepn. of diacetylbiophenyl

159436-87-0

prepn. and crystal structure of racemic

94113-07-2

prepn. and reaction with bis(methylsulfanyl)pyridylpropenone

159389-27-2
 prepn. and reaction with transition metal compds.
 159436-89-2
 159436-91-6
 159436-93-8
 prepn. of

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121:178913
 Asymmetric catalysis of Diels-Alder cycloaddition by a b-amino alcohol
 derived boron complex: reasonable transition-state assembly for
 one-directional diene approach.
 Motoyama, Yukihiro; Mikami, Koichi (Dep. Chem. Technol., Tokyo Inst.,
 Tokyo 152, Japan). J. Chem. Soc., Chem. Commun., (13), 1563-4
 (English) 1994. CODEN: JCCCAT. ISSN: 0022-4936. DOCUMENT
 TYPE: Journal CA Section: 22 (Physical Organic Chemistry)

Asym. Diels-Alder reactions of glyoxylate with acid-labile Danishefsky
 dienes are catalyzed in high enantio- and cis(endo)-diastereoselectivity
 by a chiral amino alc. derived boron complex, e.g. I, via the favorable
 transition-state assembly for one-directional diene-approach from the
 site proximal to the sulfonylamino moiety.

Keywords

Diels Alder reaction glyoxylate Danishefsky diene
 boron complex catalyst Diels Alder
 stereochem Diels Alder reaction

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Stereochemistry
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 922-68-9
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 54125-02-9
 72486-93-2
 asym. Diels-Alder reactions of, with glyoxylate, catalysts for
 157492-97-2
 157492-98-3
 157492-99-4
 157493-00-0
 157493-01-1
 157493-02-2
 catalysts, for asym. Diels-Alder reactions of glyoxylate with
 acid-labile Danishefsky dienes
 157493-03-3
 157587-11-6
 prepn. of

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121:66749
 Wires incorporating a helical component, assemblies thereof, and use
 of these assemblies as catalyzer and/or to recover precious
 metals.
 Guerlet, Jean Paul; Lambert, Claude (Comptoir Lyon-Alemand-Louyot,

Fr.). PCT Int. Appl. WO 9403665 A1 17 Feb 1994, 38 pp.
 DESIGNATED STATES: W: AU, BB, BG, BR, BY, CA, CZ, FI, HU, JP,
 KP, KR, KZ, LK, MG, MN, MW, NO, NZ, PL, RO, RU, SD, SK, UA, US,
 VN; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FR, GA,
 GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (World
 Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM:
 D02G003-12. ICS: B01J035-06; B01J023-40; C01B021-26;
 C01B021-38. APPLICATION: WO 93-FR752 22 Jul 1993. PRIORITY:
 FR 92-9578 31 Jul 1992. DOCUMENT TYPE: Patent CA Section: 67
 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
 Section cross-reference(s): 49, 56
 A wire comprising ³1 helically wound wire element is described. The
 helical winding consists of a platinoid or platinoid alloy wire. Also
 described are assemblies of these wires such as knitted materials,
 fabrics and felts, and the use of these assemblies as catalyzers in the
 reaction for prep. HNO₃ and HCN, and to recover precious metals
 from these catalyzers.

Keywords

wire helical component assembly catalyzer
 nitric acid prep. catalyzer
 hydrocyanic acid prep. catalyzer
 precious metal recovery catalyzer

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Wire
 incorporating a helical component, assemblies from, as catalyzers
 Oxidation, electrochemical
 of ammonia, catalyzer for
 Catalysts and Catalysis
 wires incorporating a helical component and their assemblies as
 Transition metals, preparation
 precious, recovery of, catalyzer for
 53579-45-6
 116594-16-2
 122067-72-5
 catalyst, for prep. of nitric acid and hydrocyanic acid
 7664-41-7, reactions
 oxidn. of, catalyzer for
 74-90-8, preparation
 7697-37-2, preparation
 prep. of, catalyzer for

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119:64552

Sites and gene products involved in lambdoid phage DNA packaging.
 Smith, Michael P.; Feiss, Michael (Coll. Med., Univ. Iowa, Iowa City, IA
 52242, USA). J. Bacteriol., 175(8), 2393-9 (English) 1993. CODEN:
 JOBAAY. ISSN: 0021-9193. DOCUMENT TYPE: Journal CA Section:
 3 (Biochemical Genetics) Section cross-reference(s): 7, 10
 Coliphage 21 is a temperate lambdoid coliphage, and the genes that
 encode the head proteins of 1 and 21 are descended from a common
 ancestral bacteriophage. The sequencing of terminase genes 1 and 2
 of 21 was completed, along with that of a segment at the right end of 21
 DNA that includes the R4 sequence. The R4 sequence, a site that is
 likely involved in termination of DNA packaging, was found to be very
 similar to the R4 sequences of 1 and f80, suggesting that R4 is a
 recognition site that is not phage specific. DNA packaging by 21 is
 dependent on a host protein, integration host factor. A series of
 mutations in gene 1 (her mutations), which allow integration host
 factor-independent DNA packaging by 21, were found to be missense
 changes that affect predicted α -helices in gp1. Gp2, the large

terminase subunit, is predicted to contain an ATP-binding domain and, perhaps, a second domain important for the cos-cutting activity of terminase, orf1, an open reading frame analogous in position to FI, a gene involved in DNA packaging, shares some sequence identity with FI. Orf1 was inactivated with nonsense and insertion mutations; these mutations were found not to affect phage growth. Coliophage 21 was also not able to complement a 1 FI mutant.

Keywords

phage 21 packaging gene 1 2
terminase gene sequence coliphage 21
DNA packaging phage 21 protein GpFI
R box terminase cleavage phage 21

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Proteins, specific or class
GpFI, lambdoid phage 21 DNA prohead assembly catalyst, of
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in phage DNA packing of
Gene, microbial
for terminase subunit 2, of lambdoid phage 21, sequence and role
in phage DNA packing of
Deoxyribonucleic acid sequences
of terminase subunit genes of lambdoid phage 21
Protein sequences
of terminase subunits, of lambdoid phage 21
Proteins, specific or class
phage head, of lambdoid phage 21, phage DNA packing in relation
to
Proteins, specific or class
IHF (integration host factor), in lambdoid phage 21 DNA packaging
148156-44-9
148156-45-0
148156-46-1
148156-47-2
148156-48-3
148156-49-4
148175-04-6
amino acid sequence of
97622-49-6
148156-43-8
sequence and role in lambdoid phage DNA packaging of
140825-65-6
sequence of and DNA packaging requirement for

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118:47862

Electrochemically induced transformations of monolayers formed by self-assembly of mercaptoethanol at gold.
Weisshaar, Duane E.; Walczak, Mary M.; Porter, Marc D. (Dep. Chem., Iowa State Univ., Ames, IA 50011, USA). Langmuir, 9(1), 323-9 (English) 1993. CODEN: LANGD5. ISSN: 0743-7463. DOCUMENT TYPE: Journal CA Section: 72 (Electrochemistry) Section cross-reference(s): 66
The structural stability of monolayers formed by the self-assembly of mercaptoethanol (HOCH₂CH₂SH) at annealed, mica-supported Au (ME/Au) was characterized by using electrochem., IR spectroscopic,

and x-ray photoelectron spectroscopic techniques. The study was motivated by the observation that the 1-electron reductive desorption of long-chain n-alkanethiolates by linear sweep voltammetry generally exhibits a single well-defined wave, while that of ME/Au produces 2 waves. The relative magnitudes of the waves for ME/Au are dependent on the extent of exposure to the lab. ambient. Electrochem. oxidn. of ME/Au shows that 3 oxidative processes occur sequentially. In the 1st process, ME/Au is catalytically oxidized by a 4-electron process to a sulfidoacetic acid monolayer (adsorbed mercaptoacetic acid, MAA/Au). In the 2nd process, the electrogenerated MAA/Au undergoes C-S bond cleavage, which gives rise to the 2nd reductive desorption wave. In this case, as the extent of oxidn. increases, a 3rd desorption wave is also produced as a result of gradual formation of adsorbed polysulfur species. In the 3rd oxidative process, the remaining S monolayer was oxidatively desorbed from the surface. The results, coupled with earlier literature reports, suggest that electrochem. oxidn. of thiolates on Au is a multipath process with the favored path dependent on the reaction conditions and the chem. compn. of the thiolate. The spontaneous oxidn. of ME/Au may proceed via the same path as the electrochem. oxidn. (ME/Au to MAA/Au to S/Au), or adsorption of thiolate may activate the C-S bond, leading to direct conversion from ME/Au to S/Au.

Keywords

mercaptoethanol oxidn electrochem gold electrode
adsorption electroadsorption mercaptoethanol electrooxidn
desorption oxidative mercaptoethanol gold
bond cleavage carbon sulfur mercaptoethanol oxidn
catalyst electrocatalyst gold mercaptoethanol

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Mica-group minerals, uses
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Adsorbed substances
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7440-57-5, properties
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7704-34-9, compds.
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60-24-2
oxidn. of, electrochem., on gold, adsorption and desorption in

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116:220668

Nitrogen oxides sensor assembly for analysis of flowing gases such as air.

Dalla Betta, Ralph D.; Reed, Daniel L.; Schubert, Priscilla (Catalytica, Inc.; Wheelock, E. Thomas, USA). PCT Int. Appl. WO 9119975 A1 26 Dec 1991, 24 pp. *DESIGNATED STATES: W: AU, BR, JP, KR; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE. (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: G01N033-00. ICS: G01N025-20; G01N027-00; G01N021-00; F28D007-00; B01J019-00. APPLICATION: WO 91-US4177 12 Jun 1991. PRIORITY: US 90-536888 12 Jun 1990. DOCUMENT TYPE: Patent CA Section: 59 (Air Pollution and Industrial Hygiene) NOx are detd. in air or exhaust gases by passing the air through a filter to remove particles and then through a textile or glass or mineral wool impregnated with a reductant such as cyanuric acid. The mixt. of NOx and reductant is then passed over the sensor assembly which comprises 2 elements, one of which is made up of a catalyst on a temp. measuring device and the other of which is a gas stream ambient temp. measuring device. The method is suitable for monitoring exhaust gases in automobiles and other vehicles.

Keywords

nitrogen oxide monitor exhaust gas

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Air analysis

nitrogen oxides detn. in, catalytic sensor for

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Glass fibers, uses

wool, reductant-impregnated, in catalytic sensor for nitrogen oxides detn. in air

1313-99-1, uses

1314-35-8, uses

1314-62-1, uses

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7439-96-5, uses

7439-98-7, uses

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7440-17-7, uses

7440-18-8, uses

7440-33-7, uses

7440-47-3, uses

7440-48-4, uses

7440-50-8, uses

7440-62-2, uses

11098-99-0

11104-61-3

11113-84-1

11118-57-3

11129-60-5

18088-11-4

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11104-93-1, analysis

detn. of, in air, catalytic sensor for

108-80-5

in catalytic sensor for nitrogen oxides detn. in air

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126:346701

Optimization of the metallic three-way catalyst behavior.

Luoma, Marjo; Harkonen, Matti; Lylykangas, Reijo; Sohlo, Jorma

(Kemira Chemicals Oy, Finland). Soc. Automot. Eng., [Spec. Publ.] SP, SP-1260(Low Emission Vehicle Technologies), 89-99 (English) 1997 Society of Automotive Engineers CODEN: SAESA2. ISSN: 0099-5908. DOCUMENT TYPE: Journal CA Section: 59 (Air Pollution and Industrial Hygiene) Section cross-reference(s): 51, 67
The effects of catalyst design parameters are studied using the one-dimensional transient model for a single catalyst channel. The results indicate that the catalyst precious metal loading has a great influence on the catalyst light-off, and the geometric area (catalyst length and cell d.) and the hydraulic radius (catalyst cell d.) on the steady state conversion efficiency. The ceramic catalyst seems to have a higher tendency towards thermal shock than the metallic. The optimization of the metallic catalyst behavior inevitably leads to the use of a high cell d. to obtain the best steady state behavior. The precious metal loading needed to reach fast light-off can be optimized by shortening the substrate length. The behavior of the advanced metallic catalyst is compared with the 400 cpsi ceramic catalyst using the three-dimensional transient model. This simulates the fluid dynamics, chem. kinetics and heat and mass transfer taking place in a catalyst and its assembly. The vol. of the metallic catalyst is a half of that of the ceramic. The geometric areas of the catalysts are almost identical. Both catalysts contain the same amt. of precious metals. The length of the ceramic honeycomb is double compared to that of the metallic. Due to the smaller heat capacity, better heat conduction and heat transfer the 800 cpsi metallic catalyst heats up faster than the 400 cpsi ceramic one. Furthermore, the better mass transfer characteristics of the metallic catalyst enable an almost 4.5% higher conversion efficiency than the ceramic.

Keywords

exhaust gas three way catalyst optimization

Index Entries

Exhaust gas catalytic converters
Three-way catalysts
optimization of metallic three-way catalyst
7440-05-3, uses
7440-16-6, uses
630-08-0, processes
optimization of metallic three-way catalyst

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127:222997

Catalyst assembly for placement in anode compartment of internal reforming fuel cell.

Farooque, Mohammad; Patel, Pinakin S.; Allen, Jeffrey (Energy Research Corporation, USA). U.S. US 5660941 A 26 Aug 1997, 10 pp. (United States of America). CODEN: USXXAM. CLASS: ICM: H01M008-18. NCL: 429019000. APPLICATION: US 96-667980 19 Jun 1996. DOCUMENT TYPE: Patent CA Section: 52

(Electrochemical, Radiational, and Thermal Energy Technology)
The anode compartment includes a current collector having peak regions with spacer regions between them and facing the anode. The catalyst assembly is as a member including a catalyst material and having through openings in the member of distribution and configuration so that the member can be inserted over the current collector with the peak regions being received in the through openings and holding the member.

Keywords

catalyst assembly internal reforming fuel cell

anode compartment catalyst assembly fuel cell

Index Entries

Reforming catalysts

assembly for placement in anode compartment of internal reforming fuel cell

Fuel cells

catalyst assembly for internal reforming fuel cell

Fuel cell anodes

catalyst assembly for placement in anode compartment of internal reforming fuel cell

7440-02-0, uses

expanded in catalyst assembly for placement in anode compartment of internal reforming fuel cell

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126:255849

Assembly of mesoporous molecular sieves containing wormhole motifs by a nonionic surfactant pathway: control of pore size by synthesis temperature.

Prouzet, Eric; Pinnavaia, Thomas J. (Dep. Chem. Cent. Fund. Mater. Res., Michigan State Univ., East Lansing, MI 48824, USA). Angew. Chem., Int. Ed. Engl., 36(5), 516-518 (English) 1997 VCH CODEN: ACIEAY. ISSN: 0570-0833. DOCUMENT TYPE: Journal CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms) Section cross-reference(s): 66, 78

The Mobil M41S family of mesoporous mol. sieves has expanded greatly the range of materials available for heterogeneous catalysis and supramol. assembly. These mesostructures are formed through structure-directing interactions between surfactant micelles and inorg. precursors. Assembly can occur by electrostatic charge-matching mechanisms or by elec. neutral pathways that depend on hydrogen bonding or complexation at the org./inorg. interface. Whereas M41S structures characteristically exhibit long-range hexagonal or cubic symmetry, less ordered structures with wormhole motifs have been obtained recently through the N010 assembly of nonionic polyethylene oxide (PEO) based surfactants (N0) and neutral inorg. precursors (I0). These wormhole structures, which have been denoted MSU-X, lack regular channel packing order. Nevertheless, they exhibit uniform channel diams. over a range comparable to M41S materials and offer attractive advantages for processing, owing in part to the low cost and biodegradability of N0 surfactants. Here we report an unprecedented property of N0 surfactants for mesostructure assembly, namely, the ability to control pore size rationally simply by regulating the synthesis temp. in the presence of a single surfactant. Previous approaches to mediating the pore sizes of mesostructures have depended on the use of surfactants of different chain lengths, org. cosurfactants, and post-synthesis hydrothermal treatments for modifying pore structure. However, only the N010 pathway is capable of tailoring pore size by choice of the assembly temp. For instance, the av. pore diam. of MSU-X silicas can be altered by as much as 2.4 nm simply by controlling the assembly temp. over a relatively narrow range (25-65°).

Keywords

mesoporous mol sieve synthesis pore size
nonionic surfactant mesoporous mol sieve synthesis
catalyst mesoporous mol sieve synthesis

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Secondary alcohols

C11-15, ethoxylated, Tergitol 15S9, Tergitol 15S12 and Tergitol

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 Nonionic surfactants
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 Catalysts
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 25322-68-3, C11-C15 monoalkyl ether derivs.
 7631-86-9, properties
 assembly of mesoporous mol. sieves contg. wormhole motifs by
 nonionic surfactant pathway and control of pore size by
 synthesis temp.

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126:251362

Molecular recognition for the enantioselective hydrolysis of amino acid
 esters in functional molecular assembly systems.
 Goto, Koichi; Ueoka, Ryuichi (Dep. Ind. Chem., Kumamoto Inst.
 Technol., Kumamoto 860, Japan). Nippon Kagaku Kaishi, (2),
 127-133 (Japanese) 1997 Nippon Kagakkai CODEN: NKAKB8.
 ISSN: 0369-4577. DOCUMENT TYPE: Journal CA Section: 34 (Amino
 Acids, Peptides, and Proteins)
 Enantioselective hydrolysis of amino acid esters by L-histidine derivs. in
 the mol. assemblies composed of single- and double-chain surfactants
 was investigated. The remarkably high enantioselectivity
 ($k_a, \text{obsdL}/k_a, \text{obsdD} = 1000$) was attained for the hydrolysis of long-chained
 substrates (N-dodecanoyl-D(L)-phenylalanine p-nitrophenyl ester;
 C12-D(L)-Phe-PNP) catalyzed by the active tripeptide
 (N-(benzyloxycarbonyl)-L-phenylalanyl-L-histidyl-L-leucine;
 Z-Phe-His-Leu) in the coaggregate systems composed of 41 mol%
 hexadecyltrimethylammonium bromide (CTAB) and 59 mol%
 ditetradecyldimethylammonium bromide (2C14Br) at the specific ionic
 strength ($m = 0.02$). Furthermore, the computer modeling (MOPAC
 calcn.) study suggests that a favorable mol. recognition between the
 substrate and the catalyst through the effective hydrophobic
 interactions and hydrogen bonds should be very important for the
 enhancement of enantioselectivity.

Keywords

enantioselective hydrolysis amino acid ester
 histidine deriv enantioselective hydrolysis catalyst
 mol assembly surfactant tripeptide
 computer modeling
 tripeptide enantioselective hydrolysis catalyst
 coaggregate system surfactant tripeptide

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 tripeptides and surfactants
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 Physicochemical simulation
 Stereoselective hydrolysis
 Surfactants
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 31373-65-6
 40036-79-1
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 2578-85-0
 75531-11-2
 75531-12-3
 mol. recognition for enantioselective hydrolysis of amino acid
 esters in functional mol. assembly systems contg.
 tripeptides and surfactants

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127:337357

Study of the Structure and Mechanism of Formation through
 Self-Assembly of Mesostructured Vanadium Oxide.

Luca, Victor; Hook, James M. (School of Chemistry and NMR Facility,
 University of New South Wales, Sydney 2052, Australia). Chem.

Mater., 9(12), 2731-2744 (English) 1997 American Chemical Society

CODEN: CMATEX. ISSN: 0897-4756. DOCUMENT TYPE: Journal

CA Section: 66 (Surface Chemistry and Colloids) Section

cross-reference(s): 73, 77

The structure and mechanism of formation of a novel hexagonal
 mesostructured vanadium oxide-surfactant composite (HMVO),
 synthesized by acid-catalyzed hydrolysis of ethanolic
 cetyltrimethylammonium vanadate (CTAV) soln., has been studied by a
 variety of spectroscopic techniques. The poorly cryst. CTAV precursor
 used in the synthesis has been characterized and is shown to consist of
 pyrovanadate-like anions in which one oxygen atom is shared between
 vanadate tetrahedra. The HMVO formed from this precursor appears

to feature a distorted octahedral vanadium coordination similar to that found in extended structures such as the two-dimensional vanadium pentoxide gel network. Information on the soln. speciation during the synthesis is monitored by ^{51}V NMR spectroscopy. Prior to acid addn., the ethanolic soln. of CTAV shows a single narrow resonance at -556.7 ppm, assigned to a tetrahedral diester anion $[\text{VO}_2(\text{OEt})_2]^-$, undergoing fast reorientational averaging of the quadrupole interaction in soln. This behavior indicates that mesophases do not exist in soln. prior to the initiation of acid-catalyzed polymn. Progressive addn. of aq. acid results in a monotonic decrease in the diester concn. with concomitant formation of minor quantities of higher vanadate oligomers and an increasing proportion of mesophase not directly detectable by soln. ^{51}V NMR. The water in the aq. acid plays an important role as an initiator in the hydrolysis of the diester, producing the higher oligomers, as well as a postulated transitory intermediate, which condenses rapidly through the action of the stronger acid, HCl , and directed by the surfactant to give the mesostructured material. The presence of the surfactant is seen to be crucial for inhibiting the formation of anionic decavanadate clusters, and VO_2^+ species, which are normally assocd. with the acidification of aq. vanadate solns. These observations are consistent with a formation mechanism in which the vanadium mesophase is generated by cooperative formation of micellar entities and higher vanadate oligomers.

Keywords

mesoporous vanadium oxide surfactant composite prepn

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Porous materials

mesoporous; structure and mechanism of formation through self-assembly of mesostructured vanadium oxide

Acid hydrolysis

of cetyltrimethylammonium vanadate; structure and mechanism of formation through self-assembly of mesostructured vanadium oxide

NMR (nuclear magnetic resonance)

solid-state; structure and mechanism of formation through self-assembly of mesostructured vanadium oxide

EXAFS spectra

IR spectra

Micelles

Raman spectra

Surfactants

XANES spectra

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NMR; structure and mechanism of formation through self-assembly of mesostructured vanadium oxide

7647-01-0, uses

hydrolysis catalyst; structure and mechanism of formation through self-assembly of mesostructured vanadium oxide

197720-25-5

hydrolysis; structure and mechanism of formation through self-assembly of mesostructured vanadium oxide

11099-11-9

oxide-surfactant composites; structure and mechanism of formation through self-assembly of mesostructured vanadium oxide

126:341202

Assemblases and coupling proteins in thick filament assembly.

Liu, Feizhou; Barral, Jose M.; Bauer, Christopher C.; Ortiz, Irving; Cook, Richard G.; Schmid, Michael F.; Epstein, Henry F. (Department of Neurology, Baylor College of Medicine, Houston, TX 77030, USA).

Cell Struct. Funct., 22(1), 155-162 (English) 1997 Japan Society for

Cell Biology CODEN: CSFUDY. ISSN: 0386-7196. DOCUMENT

TYPE: Journal; General Review CA Section: 12 (Nonmammalian

Biochemistry)

A review with 44 refs. Thick filaments are stable assemblies of myosin that are characteristic of specific muscle types from both vertebrates and invertebrates. In general, their structure and assembly require remarkably precise detn. of lengths and diams., structural differentiation and nonequivalence of myosins, a high degree of inelasticity and rigidity, and dynamic regulation of assembly and disassembly in response to both extracellular and intracellular signals. Directed assembly of myosin in which addnl. proteins function in key roles, therefore, is more likely to be significant than the simple self assembly of myosin into thick filaments. The nematode *Caenorhabditis elegans* permits a wide spectrum of biochem., genetic, mol. and structural approaches to be applied to the exptl. testing of this hypothesis. Biochem. anal. of *C. elegans* thick filaments reveals that paramyosin, a homolog of the myosin rod that is the unique product of a single genetic locus, exists as two populations which differ by post-translational modification. The major paramyosin species interacts with the two genetically specified myosin heavy chain isoforms. The minor paramyosin species is organized within the cores of the thick filaments, where it is assocd. stoichiometrically with three recently identified proteins P20, P28 and P30. These proteins have now been characterized molecularly and contain unique, novel amino acid sequences. Structural anal. of the core shows that seven paramyosin subfilaments are crosslinked by addnl. internal proteins into a highly rigid tubule. P20, P28 and P30 are proposed to couple the paramyosin subfilaments together into the core tubule during filament assembly. Mutants that affect paramyosin assembly are being characterized for alterations in the core proteins. A fourth protein has been identified recently as the product of the *unc-45* gene. Computational anal. of this gene's DNA suggests that the predicted protein may exhibit protein phosphatase and chaperone activities. Genetic anal. shows that three classes of specific *unc-45* mutant proteins differentially interact with the two myosins during thick filament assembly. The *unc-45* protein is proposed to be a myosin assemblase, a protein catalyst of thick filament assembly.

Keywords

review paramyosin thick filament myosin nematode

Index Entries

Caenorhabditis elegans

Thick filament

Myosins

Paramyosins

Proteins (specific proteins and subclasses)

assemblases and coupling proteins in thick filament assembly

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126:62612

Analysis of the electrochemical characteristics of a direct methanol fuel cell based on a Pt-Ru/C anode catalyst.

Arico, A. S.; Creti, P.; Kim, H.; Mantegna, R.; Giordano, N.; Antonucci, V. (CNR Inst. Transformation Storage Energy, Messina 98126, Italy). J.

Electrochem. Soc., 143(12), 3950-3959 (English) 1996
 Electrochemical Society CODEN: JESOAN. ISSN: 0013-4651.
 DOCUMENT TYPE: Journal CA Section: 52 (Electrochemical,
 Radiational, and Thermal Energy Technology)

A vapor-feed direct methanol fuel cell based on a Nafion 117 solid polymer electrolyte was investigated. Pt-Ru/C and Pt/C catalysts were employed for methanol oxidn. and oxygen redn., resp. The structure, surface, and morphol. of the catalysts were investigated by x-ray powder diffraction, XPS, and transmission electron microscopy. Cryst. face-centered cubic phases were found in the Pt and Pt-Ru catalysts. The alloy compn. in the Pt-Ru/C catalyst was different from the nominal compn., probably due to the formation of surface RuOx species, as indicated by XPS. Transmission electron microscopy observation showed an increase of the av. particle size and particle agglomeration in the Pt-Ru/C catalyst compared to the Pt/C catalyst. The membrane/electrode assembly was prepd. by using a "paste process" method. SEM and energy dispersive x-ray analyses showed good adhesion of catalyst layers to the membrane and a homogeneous distribution of the ionomer inside the catalyst. AC-impedance and galvanostatic steady-state polarization techniques were used to investigate the electrochem. performance of the direct methanol fuel cell.

Keywords

methanol fuel cell anode catalyst
 platinum carbon anode fuel cell

Index Entries

Electrochemical oxidation catalysts
 Electrochemical reaction catalysts
 Electrochemical reduction catalysts
 Fuel-cell anodes
 Carbon black, uses
 anal. of the electrochem. characteristics of a direct methanol fuel cell based on a Pt-Ru/C anode catalyst
 7440-06-4, uses
 7440-18-8, uses
 66796-30-3
 67-56-1, uses
 anal. of the electrochem. characteristics of a direct methanol fuel cell based on a Pt-Ru/C anode catalyst
 7782-44-7, reactions
 redn.; anal. of the electrochem. characteristics of a direct methanol fuel cell based on a Pt-Ru/C anode catalyst

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126:4411

Novel mutants in the 5' upstream region of the portal protein gene 20 overcome a gp40-dependent prohead assembly block in bacteriophage T4.

Yap, Nida L.; Rao, Venigalla Basaveswara (Dep. Biol., Catholic Univ. America, Washington, DC 20064, USA). J. Mol. Biol., 263(4), 539-550 (English) 1996 Academic CODEN: JMOBAK. ISSN: 0022-2836.

DOCUMENT TYPE: Journal CA Section: 10 (Microbial, Algal, and Fungal Biochemistry) Section cross-reference(s): 3

The exact mechanism by which the double-stranded (ds) DNA bacteriophages incorporate the portal protein at a unique vertex of the icosahedral capsid is unknown. In phage T4, there is evidence that this vertex, constituted by 12 subunits of gp20, acts as an initiator for the assembly of the major capsid protein and the scaffolding proteins into a prolate icosahedron of precise dimensions. Assembly of the T4 initiator vertex occurs on the membrane and is facilitated by the

non-structural protein gp40. Gp40 apparently acts as a catalyst for the gp20 assembly and a direct interaction between gp20 and gp40 has been proposed based on the genetic evidence that second site suppressors of g40 mutants map in g20. But, surprisingly, we found that these 40 bypass mutants arose not by alterations in the g20 structural gene, but by alterations in the upstream non-coding region. At least six independent bypass mutants were isolated with all except one having mutations in the non-coding region. The only exception that had a mutation in the coding region was a silent mutation, since it did not alter the amino acid sequence of gp20. The bypass mutants produced a three- to fivefold overexpression of gp20. That the gp20 overexpression is directly responsible for 40 bypass was shown by a no. of approaches. The overexpression was apparently due to a secondary structural change in the g20 transcript resulting in an enhanced translational initiation of g20 message. The data suggest that the regulation of portal protein gene expression is an important regulator of prohead assembly in bacteriophage T4.

Keywords

bacteriophage T4 40bypass mutants gene 20
portal protein 20 gene T4 promoter
prohead assembly T4 portal protein gene
DNA sequence T4 g20 40bypass mutants

Index Entries

Point mutation
40bypass mutants RII and RIV; novel mutants in the 5' upstream region of the portal protein gene 20 overcome a gp40-dependent prohead assembly block in bacteriophage T4
Proteins (specific proteins and subclasses)
gene 20 portal protein; 5' upstream region point mutation mutants show overexpression of gp20, a common mechanism to overcome gp40 assembly block
Proteins (specific proteins and subclasses)
gene 40 portal protein; novel mutants in the 5' upstream region of the portal protein gene 20 overcome a gp40-dependent prohead assembly block in bacteriophage T4
Coliphage T4
Promoter (genetic element)
novel mutants in the 5' upstream region of the portal protein gene 20 overcome a gp40-dependent prohead assembly block in bacteriophage T4
DNA sequences
of the 5' upstream region of the portal protein gene 20 in bacteriophage T4 40bypass mutants RII and RIV
Stem-loop structure
the gp20 overexpression due to secondary structural change in the g20 transcript resulting in an enhanced translational initiation of g20 message

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126:289499

Oxidative thymine dimer repair in the DNA helix.

Dandliker, Peter J.; Holmlin, R. Erik; Barton, Jacqueline K. (Div. Chem. and Chem. Eng., California Inst. Technol., Pasadena, CA 91125, USA).

Science (Washington, D. C.), 275(5305), 1465-1468 (English) 1997

American Association for the Advancement of Science CODEN:

SCIEAS. ISSN: 0036-8075. DOCUMENT TYPE: Journal CA Section:

6 (General Biochemistry)

The metallointercalator Rh(phi)2DMB3+ (phi, 9,10-phenanthrenequinone diimine; DMB, 4,4'-dimethyl-2,2'-bipyridine) catalyzed the repair of a

thymine dimer incorporated site-specifically in a 16-base pair DNA duplex by means of visible light. This repair could be accomplished with rhodium noncovalently bound to the duplex and at long range (16 to 26 angstroms), with the rhodium intercalator tethered to either end of the duplex assembly. This long-range repair was mediated by the DNA helix. Repair efficiency did not decrease with increasing distance between intercalated rhodium and the thymine dimer, but it diminished with disruption of the intervening p-stack.

Keywords

thymine dimer DNA repair metallointercalator catalyst
rhodium intercalator DNA repair electron transfer

Index Entries

Light

400 or 313 nm, use in DNA repair; use of metallointercalator catalyst in oxidative thymine dimer repair in DNA helix

Electron transfer

through DNA, role in thymine dimer repair; use of metallointercalator catalyst in oxidative thymine dimer repair in DNA helix

Molecular structure-property relationship

thymine dimer repair-affecting, of DNA; use of metallointercalator catalyst in oxidative thymine dimer repair in DNA helix

DNA repair

DNA

use of metallointercalator catalyst in oxidative thymine dimer repair in DNA helix

189088-23-1

188995-76-8

188995-77-9

189088-24-2

189088-25-3

189088-26-4

189088-27-5

189088-28-6

189088-29-7

189088-30-0

DNA duplex with covalently linked metallointercalator; use of metallointercalator catalyst in oxidative thymine dimer

repair in DNA helix

188995-75-7

DNA duplex with thymine dimer; use of metallointercalator catalyst in oxidative thymine dimer repair in DNA helix

188934-41-0

DNA duplex without thymine dimer (after repair); use of metallointercalator catalyst in oxidative thymine dimer

repair in DNA helix

182878-75-7

183072-12-0

188958-62-5

3660-32-0

use of metallointercalator catalyst in oxidative thymine dimer repair in DNA helix

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126:270205

Photochemical Charge Transfer and Hydrogen Evolution Mediated by Oxide Semiconductor Particles in Zeolite-Based Molecular Assemblies.

Kim, Yeong Il; Keller, Steven W.; Krueger, Jonathan S.; Yonemoto, Edward H.; Saupe, Geoffrey B.; Mallouk, Thomas E. (Department of

Chemistry, National Fisheries University of Pusan, Pusan 608-737, S. Korea). J. Phys. Chem. B, 101(14), 2491-2500 (English) 1997
 American Chemical Society CODEN: JPCBFK. ISSN: 1089-5647.
 DOCUMENT TYPE: Journal CA Section: 74 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes) Section cross-reference(s): 67

Two integrated systems for light-induced vectorial electron transfer are described. Both utilize photosensitized semiconductor particles grown in linear channel zeolites as components of the electron transfer chain. One system consists of internally platinized zeolites L and mordenite contg. TiO₂ particles and methylviologen ions, with a size-excluded photosensitizer, tris(2,2'-bipyridyl-4,4'-dicarboxylate)ruthenium (RuL32+), adsorbed on the external surface of the zeolite/TiO₂ composite. In the other system, Nb₂O₅ replaces TiO₂. The kinetics of photochem. electron transfer reactions and charge sepn. were studied by diffuse reflectance flash photolysis. Despite very efficient initial charge sepn., the TiO₂ system does not generate hydrogen photochem. in the presence of an electrochem. reversible, anionic electron donor, methoxyaniline N,N'-bis(Et sulfonate). Only the Nb₂O₅-contg. composites evolved hydrogen photochem. under these conditions. These results are interpreted in terms of semiconductor band energetics and the irreversibility of electron transfer from Nb₂O₅ to intra-zeolitic platinum particles.

Keywords

photochem charge transfer hydrogen evolution catalyst
 electron donor sensitizer semiconductor photochem catalyst
 zeolite based mol assembly photolysis catalyst
 photoinduced electron transfer internally platinized zeolite

Index Entries

Electron transfer kinetics
 Flash photolysis
 Photoinduced electron transfer
 UV and visible spectra
 photochem. charge transfer and H₂ evolution in electron donor/sensitizer/semiconductor/electron acceptor/catalyst system
 Adsorbed substances
 L-type zeolites
 Mordenite-type zeolites
 photochem. charge transfer and hydrogen evolution mediated by oxide semiconductor particles in zeolite-based mol. assemblies
 75365-73-0
 electron acceptor; photochem. charge transfer and H₂ evolution in electron donor/sensitizer/semiconductor/electron acceptor/catalyst system
 1313-96-8
 1317-70-0
 7440-06-4, uses
 13463-67-7, uses
 1333-74-0, formation (nonpreparative)
 171925-67-0
 photochem. charge transfer and H₂ evolution in electron donor/sensitizer/semiconductor/electron acceptor/catalyst system
 15978-93-5
 44046-65-3
 platinum precursor; photochem. charge transfer and H₂ evolution in electron donor/sensitizer/semiconductor/electron acceptor/catalyst system
 97333-46-5

sensitizer; photochem. charge transfer and H2 evolution in electron donor/sensitizer/semiconductor/electron acceptor/catalyst system
546-68-9
titania precursor; photochem. charge transfer and H2 evolution in electron donor/sensitizer/semiconductor/electron acceptor/catalyst system

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126:257829

Encapsulant with fluxing properties, an electrical assembly, and encapsulation of the assembly with the encapsulant.
Kirsten, Kenneth J. (Kirsten, Kenneth J., USA). PCT Int. Appl. WO 9707541 A1 27 Feb 1997, 45 pp. DESIGNATED STATES: W: JP, KR, SG; RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: H01L023-488. ICS: H01B001-06; B05D005-12; B32B027-38; B32B015-08; C08G059-68; C08G059-40. APPLICATION: WO 96-US12759 9 Aug 1996. PRIORITY: US 95-514049 11 Aug 1995; US 96-644912 28 May 1996. DOCUMENT TYPE: Patent CA Section: 76 (Electric Phenomena) Section cross-reference(s): 38
Encapsulated elec. component assemblies and methods of elec. connecting an elec. component having a plurality of terminations to a component-carrying substrate having a plurality of terminations under surface mount reflow soldering conditions is described. The elec. and substrate components have an encapsulant-forming compn. sandwiched between them and encasing the pluralities of component and substrate elec. connections. The invention relates to using an encapsulant-forming compn. comprising a thermosetting resin (preferably an epoxy resin) and a crosslinking agent (preferably an anhydride) that also acts as a fluxing agent and optionally includes a catalyst for initiating crosslinking under required conditions. The gel point of the encapsulant-forming compn. is reached after the solder melts.

Keywords

encapsulant fluxing property elec component assembly
thermosetting encapsulant elec component assembly
epoxy resin encapsulant elec component assembly

Index Entries

Encapsulation

agents; encapsulant with fluxing properties for encapsulation of elec. component assemblies
Polyesters, processes
carboxyl-terminated, crosslinking agents; encapsulant with fluxing properties for encapsulation of elec. component assemblies contg.
Anhydrides
Polyanhydrides
crosslinking agents; encapsulant with fluxing properties for encapsulation of elec. component assemblies contg.
Solders
encapsulant with fluxing properties for elec. component assemblies contg.
Electric apparatus
encapsulant with fluxing properties for encapsulation of elec. component assemblies
Thermosetting plastics
Epoxy resins, processes
encapsulant with fluxing properties for encapsulation of elec.

component assemblies based on
Catalysts
Crosslinking agents
Novolak epoxy resins
encapsulant with fluxing properties for encapsulation of elec.
component assemblies contg.
Soldering
reflow; encapsulant with fluxing properties for encapsulation of elec.
component assemblies under conditions of
461-58-5
Ajicure AH 150, catalyst; encapsulant with fluxing properties for
encapsulation of elec. component assemblies contg.
31305-94-9
Araldite MY 720; encapsulant with fluxing properties for
encapsulation of elec. component assemblies contg.
301-10-0
Catachek 860, catalyst; encapsulant with fluxing properties for
encapsulation of elec. component assemblies contg.
25085-98-7
ERL 4221; encapsulant with fluxing properties for encapsulation of
elec. component assemblies contg.
90-72-2
129428-09-7
catalyst; encapsulant with fluxing properties for encapsulation of
elec. component assemblies contg.
85-42-7
85-43-8
108-30-5, processes
26590-20-5
26968-29-6
27306-28-1
crosslinking agent; encapsulant with fluxing properties for
encapsulation of elec. component assemblies contg.
37256-13-6
encapsulant with fluxing properties for elec. component assemblies
contg.
1675-54-3
25068-38-6
encapsulant with fluxing properties for encapsulation of elec.
component assemblies contg.

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126:103715
Self-assembly of heterobimetallic complexes and reactive
nucleophiles: a general strategy for the activation of asymmetric
reactions promoted by heterobimetallic catalysts.
Arai, Takayoshi; Yamada, Yoichi M. A.; Yamamoto, Noriyoshi; Sasai,
Hiroaki; Shibasaki, Masakatsu (Fac. Pharm. Sci., Univ. Tokyo Hongo,
Tokyo 113, Japan). Chem.--Eur. J., 2(11), 1368-1372 (English) 1996
VCH CODEN: CEUJED. ISSN: 0947-6539. DOCUMENT TYPE:
Journal CA Section: 22 (Physical Organic Chemistry) Section
cross-reference(s): 29
Heterobimetallic asym. catalysts, such as the
lanthanum-lithium-binaphthol complex (LaLi-BINOL), the
aluminum-lithium-binaphthol complex (AlLi-BINOL), and a newly prepd.
gallium-sodium-binaphthol complex (GaNa-BINOL), have been
self-assembled with reactive nucleophiles, such as lithium nitronates
and sodium malonates, to generate more efficient catalysts than the
parent heterobimetallic catalysts. For example, by the combined use of
La Li-BINOL (1 mol%; contains one H₂O mol.) and BuLi (0.9 mol%) as
the catalyst system, asym. nitro aldol reactions are greatly accelerated
in all cases without a decrease in the optical purity of the nitroaldol
products. Kinetics analyses have also been carried out on the
GaNa-BINOL-catalyzed Michael reaction of dibenzyl malonate with

cyclohexenone, with or without t-BuONa. The calcd. rate consts. show that the combined use of GaNa-BINOL and t-BuONa as the catalyst give reaction rates that are about 50 times faster than with GaNa-BINOL alone. This activation method should be useful for other asym. reactions catalyzed by heterobimetallic complexes.

Keywords

selfassembly heterobimetallic complex
reactive nucleophile activation asym reaction
promoted asym reaction heterobimetallic catalyst
general strategy activation asym reaction

Index Entries

Mass spectra

FAB; self-assembly of heterobimetallic complexes and reactive nucleophiles and general strategy for the activation of asym. reactions promoted by heterobimetallic catalysts
Aldol condensation

Aldol condensation catalysts

asym. and asym. nitro-; self-assembly of heterobimetallic complexes and reactive nucleophiles and general strategy for the activation of asym. reactions promoted by heterobimetallic catalysts

Aldol condensation kinetics

asym.; self-assembly of heterobimetallic complexes and reactive nucleophiles and general strategy for the activation of asym. reactions promoted by heterobimetallic catalysts

Asymmetric synthesis

Molecular association

Stereochemistry

Group IIIA element compounds

self-assembly of heterobimetallic complexes and reactive nucleophiles and general strategy for the activation of asym. reactions promoted by heterobimetallic catalysts

172277-37-1

172336-27-5

28735-55-9

53328-79-3, reactions

108229-76-1

865-48-5

4039-32-1

174782-79-7

185760-73-0

185760-74-1

185760-75-2

185760-76-3

185760-77-4

185760-78-5

185760-79-6

185760-80-9

185760-81-0

185760-82-1

185760-83-2

185760-84-3

74601-45-9

109-72-8, reactions

7732-18-5, reactions

185760-85-4

930-68-7

15014-25-2

75-52-5, reactions

79-24-3

104-53-0

108-03-2
625-48-9
930-30-3
1121-66-0
2043-61-0
50598-90-8
138668-13-0
138668-23-2
164931-75-3
172277-34-8
172277-36-0
185760-71-8
185760-72-9

self-assembly of heterobimetallic complexes and reactive nucleophiles and general strategy for the activation of asym. reactions promoted by heterobimetallic catalysts

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126:18505

Biomimetic catalysis in a larger context. Correlation of structure and function with genesis.

Hill, Craig L.; Zeng, Huadong; Zhang, Xuan (Department of Chemistry, Emory University, Atlanta, GA 30322, USA). J. Mol. Catal. A: Chem., 113(1-2), 185-190 (English) 1996 Elsevier CODEN: JMCCF2. ISSN: 1381-1169. DOCUMENT TYPE: Journal CA Section: 22 (Physical Organic Chemistry) Section cross-reference(s): 6, 7

The relationships between the formation (serial synthesis, self assembly, etc.) of biol. and man-made catalysts and their catalyzed reactions are discussed. A potentially utilitarian implication of a correlation between catalyst genesis and function is a more resilient catalyst can sense certain kinds of damage (those involved in reversal of the catalyst into its synthetic components) and repair itself. A set of correlated reactions has been developed. The catalyst, H4PVMol1040, self assembles from several components and simultaneously catalyzes a new, fast and highly selective reaction, the oxidative dehydrogenation of α -terpinene to p-cymene by tert-Bu hydroperoxide.

Keywords

biomimetic catalysis polyoxometalate oxidative dehydrogenation terpinene

Index Entries

Dehydrogenation catalysts

Dehydrogenation kinetics

Oxidative dehydrogenation

biomimetic catalysis model; H4PVMol1040 catalyst for oxidative dehydrogenation of α -terpinene to p-cymene by tert-Bu hydroperoxide

Catalysis

biomimetic; relationships between the formation (serial synthesis, self assembly, etc.) of biol. and man-made catalysts and their catalyzed reactions

Heteropoly acids

molybdovanadophosphates; H4PVMol1040 catalyst for oxidative dehydrogenation of α -terpinene to p-cymene by tert-Bu hydroperoxide

12293-15-1

75-91-2

99-86-5

99-87-6

biomimetic catalysis model; H4PVMol1040 catalyst for oxidative

dehydrogenation of α -terpinene to p-cymene by tert-Bu hydroperoxide

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126:108034

Platinum-catalyzed sulfur dioxide oxidation revisited. Assembly of acid- and sintering-resistant honeycomb washcoat and catalytically active phase using sols of silica, zirconia, and platinum. Felthouse, T. R.; Berkel, D. A.; Jost, S. R.; McGrew, E. L.; Vavere, A. (Monsanto Enviro-Chem Systems, Inc., St. Louis, MO 63167, USA). Adv. Catal. Nanostruct. Mater., 91-115. Edited by: Moser, William R. Academic: San Diego, Calif. (English) 1996. CODEN: 63URAA. DOCUMENT TYPE: Conference CA Section: 59 (Air Pollution and Industrial Hygiene) Section cross-reference(s): 67 A novel technique was developed for washcoat and active phase loadings using sols of silica, zirconia, and Pt on mullite honeycomb substrate, and the results are discussed. The thermal and chem. aging studies demonstrate superiority of these newly developed Pt honeycomb catalysts in comparison with com. Pt(Al₂O₃)/honeycomb catalyst. The washcoat has the molar ratio of Pt/ZrO₂/SiO₂ of 1:115:250 and has nanophase of Pt crystallites of 60-120 Å, a cubic ZrO₂ phase, and silica phase.

Keywords

exhaust gas sulfur dioxide oxidn
platinum catalyst sulfur dioxide oxidn
mullite honeycomb platinum zirconia silica catalyst

Index Entries

Oxidation catalysts
Pt/ZrO₂/SiO₂; platinum zirconia silica sol washcoat on mullite honeycomb for exhaust catalyst for sulfur dioxide oxidn
Exhaust gases (engine)
platinum zirconia silica sol washcoat on mullite honeycomb for exhaust catalyst for sulfur dioxide oxidn
1314-23-4, uses
7440-06-4, uses
7631-86-9, uses
Pt/ZrO₂/SiO₂; platinum zirconia silica sol washcoat on mullite honeycomb for exhaust catalyst for sulfur dioxide oxidn
1302-93-8
honeycomb; platinum zirconia silica sol washcoat on mullite honeycomb for exhaust catalyst for sulfur dioxide oxidn

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127:299366

Metallic monolith and plates for the assembly thereof. Sung, Shiang; Hochmuth, John K. (Engelhard Corp., USA). U.S. US 5681538 A 28 Oct 1997, 18 pp. (United States of America). CODEN: USXXAM. CLASS: ICM: B01J035-04. NCL: 422211000. APPLICATION: US 95-381804 1 Feb 1995. DOCUMENT TYPE: Patent CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms) Section cross-reference(s): 47 A monolith suitable for use as a heat exchanger or as a carrier for a catalyst member is assembled from a plurality of plates that are mounted one atop the next. The plates are generally rectangular and define a central baffle portion having a pair of substantially straight, parallel sides and having attached to the baffle portion at the ends thereof a support flange which is bendable upward into a configuration that enables it to support a second plate in spaced, parallel relation to the first plate, and anchor flanges that are bendable downward, to seal

the corners of the monolith and, optionally, to engage the support flanges of one or more underlying plates.

Keywords

metallic monolith plate assembly catalyst support
heat exchanger metallic monolith plate assembly

Index Entries

Catalyst supports
Heat exchange apparatus
metallic monolith and plates for assembly thereof

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126:19312

Fmoc-based synthesis of glycolate ester peptides for the assembly of de novo designed multimeric proteins using subtiligase.

Suich, Daniel J.; Ballinger, Marcus D.; Wells, James A.; DeGrado, William F. (Dep. Chem. Phys. Sci., DuPont Merck Pharm. Co., Wilmington, DE 19880, USA). Tetrahedron Lett., 37(37), 6653-6656 (English) 1996 Elsevier CODEN: TELEAY. ISSN: 0040-4039.

DOCUMENT TYPE: Journal CA Section: 34 (Amino Acids, Peptides, and Proteins) Section cross-reference(s): 7, 9

An automated method utilizing Fmoc-protected amino acids has been developed for the synthesis of glycolate ester peptides as substrates for subtiligase. As a test of this methodol., peptide esters contg. α -helical sequences that specify the assocn. into 3- and 4-helix bundles were synthesized, and used to explore the suitability of subtiligase as a tool for the generation of covalently linked bundles. The feasibility of creating de novo designed, single-chain or cyclic structures from simple, readily-synthesized modules has been demonstrated.

Keywords

subtiligase catalyst peptide glycolate ester dimerization
enzymic trimerization peptide glycolate ester
protein assembly peptide glycolate ester subtiligase

Index Entries

Peptides, reactions
esters, glycolate esters; prepn. and subtiligase dimerization and trimerization of peptide glycolate esters for the assembly of de novo designed multimeric proteins
Peptide bond formation (biological)
Proteins (general), preparation
prepn. and subtiligase dimerization and trimerization of peptide glycolate esters for the assembly of de novo designed multimeric proteins

182619-77-8
182619-80-3
182760-89-0
182760-94-7
182760-96-9
182760-97-0
182825-71-4
182825-72-5
182825-73-6
5437-45-6
71989-38-3
182619-57-4
182619-63-2
182619-68-7

182619-73-4

182760-90-3

prepn. and subtiligase dimerization and trimerization of peptide glycolate esters for the assembly of de novo designed multimeric proteins

9014-01-1

subtiligase; prepn. and subtiligase dimerization and trimerization of peptide glycolate esters for the assembly of de novo designed multimeric proteins

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127:360855

Thermally enhanced compact reformer.

Hsu, Michael S.; Hoag, Ethan D. (Ztek Corporation, USA). PCT Int.

Appl. WO 9739490 A2 23 Oct 1997, 39 pp. DESIGNATED STATES:

W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (World Intellectual Property Organization).

CODEN: PIXXD2. CLASS: ICM: H01M008-24. APPLICATION: WO

97-US4839 25 Mar 1997. PRIORITY: US 96-631432 12 Apr 1996.

DOCUMENT TYPE: Patent CA Section: 51 (Fossil Fuels, Derivatives, and Related Products)

A natural gas reformer comprising a stack of thermally conducting plates interspersed with catalyst plates and provided with internal or external manifolds for reactants. The catalyst plate is in intimate thermal contact with the conducting plates so that its temp. closely tracks the temp. of the thermally conducting plate, which can be designed to attain a near isothermal state in-plane to the plate. One or more catalysts may be used, distributed along the flow direction, in-plane to the thermally conducting plate, in a variety of optional embodiments. The reformer may be operated as a steam reformer or as a partial oxidn. reformer. When operated as a steam reformer, thermal energy for the (endothermic) steam reforming reaction is provided externally by radiation and/or conduction to the thermally conducting plates. This produces. When operated as a partial oxidn. reformer, a fraction of the natural gas is oxidized assisted by the presence of a combustion catalyst and reforming catalyst. This produces carbon monoxide, hydrogen, steam and carbon dioxide. Because of the intimate thermal contact between the catalyst plate and the conducting plates, no excessive temp. can develop within the stack assembly. Details of the plate design may be varied to accommodate a variety of manifolding embodiments providing one or more inlets and exit ports for introducing, pre-heating and exhaust the reactants.

Keywords

plate reformer natural gas

Index Entries

Reforming apparatus

plate-type; thermally enhanced compact reformer

Combustion catalysts

Fuel cells

Petroleum reforming catalysts

Steam

Natural gas, processes

Platinum alloy, base

Chromium alloy, base

Nickel alloy, base
 thermally enhanced compact reformer
 1313-99-1, uses
 1314-13-2, uses
 1344-70-3
 7439-89-6, uses
 7439-98-7, uses
 7440-02-0, uses
 7440-05-3, uses
 7440-06-4, uses
 7440-47-3, uses
 7440-48-4, uses
 7440-50-8, uses
 7440-66-6, uses
 11098-99-0
 11104-61-3
 11118-57-3
 409-21-2, uses
 7429-90-5, uses
 12597-69-2, uses
 124-38-9, preparation
 630-08-0, preparation
 1333-74-0, preparation
 thermally enhanced compact reformer

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127:359170

Polymerization of supramolecular assemblies: comparison of lamellar and inverted hexagonal phases.

Srisirik Warunee; Lee, Youn-Sik; Sisson, Thomas M.; Bondurant, Bruce; O'Brien, David F. (Dep. Chem., C. S. Marvel Res. Lab., Univ. Arizona, Tucson, AZ 85721, USA). Tetrahedron, 53(45), 15397-15414 (English) 1997 Elsevier CODEN: TETRA. ISSN: 0040-4020.

DOCUMENT TYPE: Journal CA Section: 35 (Chemistry of Synthetic High Polymers) Section cross-reference(s): 36

The inverted hexagonal (HII) lipid phase was successfully polycondensed from amphiphiles, which upon hydration form assemblies that can then be polycondensed with retention of structure. Radical chain polymers in lamellar and HII phases were compared. The HII phase can be considered as aqueous columns encased with a monolayer of lipids and arranged in a hexagonal pattern; the polar head groups are well-ordered at the water interface, whereas the lipid tails are disordered to fill the volume between the tubes of water. A phosphoethanolamine (PE) with dienoyl groups in each lipid tail was hydrated PE (1/1 wt. lipid/water) to form the HII phase. Polymerization to high conversion was accomplished at 60° using redox initiators, for 48 h. Temperature cycling of the polycondensed HII phase showed an unaltered pattern on decreasing temperature while maintaining the same lattice parameter, unlike that of the uncondensed phase where the value increased with decreasing temperature. Thus it is possible to fix the dimensions of the HII phase by crosslinking polymer of appropriately designed reactive lipids. The average degree of polymerization of lamellar and HII phases depended strongly on the initiation chemistry, but was insensitive to the lipid phases. The polymer size can be varied extensively in both phases to modify material properties.

Keywords

phosphoethanolamine dienoyl lipid phase redox polymer
 hexagonal lipid phase hydration polymer
 structure design lipid phase polymer

Index Entries

Phase composition

lamellar and hexagonal; prepn. and phase behavior and redox
 polymn. of lamellar and hexagonal phases of
 phosphoethanolamine assembly
 Amphiphiles
 Crosslinking
 Polymer phase morphology
 prepn. and characterization of phosphoethanolamine deriv. HII
 phase polymers from supramol. assemblies
 Redox polymerization
 radical; prepn. and phase behavior and redox polymn. of lamellar
 and hexagonal phases of phosphoethanolamine assembly
 4004-05-1
 attempted polymn.; attempted polymn. of DOPE lipid under redox
 conditions
 198624-43-0
 monomer; prepn. and phase behavior and redox polymn. of
 lamellar and hexagonal phases of phosphoethanolamine
 assembly
 198624-45-2
 prepn. and characterization of phosphoethanolamine deriv. HII
 phase polymers from supramol. assemblies
 198624-44-1
 9001-84-7
 prepn. and phase behavior and redox polymn. of lamellar and
 hexagonal phases of phosphoethanolamine assembly
 57-13-6, reactions
 110-87-2
 121-44-8, reactions
 538-75-0
 1310-58-3, reactions
 1611-56-9
 7646-69-7
 15366-08-2
 20039-37-6
 24424-99-5
 57951-36-7
 81218-52-2
 86120-40-3
 34729-09-4
 50313-71-8
 75853-50-8
 173845-49-3
 198624-40-7
 198624-41-8
 198624-42-9
 prepn. of monomers and redox polymn. of phosphoethanolamine
 deriv. lamellar and inverted hexagonal phase supramol.
 assemblies
 52-90-4, uses
 7631-90-5
 7722-84-1, uses
 7727-21-1
 7758-01-2
 redox polymn. catalyst; prepn. and phase behavior and redox
 polymn. of lamellar and hexagonal phases of
 phosphoethanolamine assembly

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127:268472
 Self-Assembly in Mixtures of Sodium Alkyl Sulfates and Alkyltrimethyl
 Ammonium Bromides: Aggregation Behavior and Catalytic
 Properties.
 Talhout, Reinskje; Engberts, Jan B. F. N. (Department of Organic and
 Molecular Inorganic Chemistry, University of Groningen, Groningen

9747 AG, Neth.). Langmuir, 13(19), 5001-5006 (English) 1997
 American Chemical Society CODEN: LANGD5. ISSN: 0743-7463.
 DOCUMENT TYPE: Journal CA Section: 67 (Catalysis, Reaction
 Kinetics, and Inorganic Reaction Mechanisms) Section
 cross-reference(s): 66

Two aq. mixts. of cationic and anionic surfactants have been studied by means of conductometry, transmission electron microscopy, and microcalorimetry. Their catalytic effects on the decarboxylation of the kinetic probe 6-nitrobenzisoxazole-3-carboxylate (6-NBIC) were also examd. in some detail. The mixts. differ profoundly in the hydrophobic match between both surfactant tails, which is perfect for dodecyltrimethylammonium bromide (DTAB) and sodium dodecyl sulfate (SDS) and poor for hexadecyltrimethylammonium bromide (CTAB) and sodium heptyl sulfate (SHS). This difference is reflected in the more pronounced synergism in crit. aggregation concn. and catalytic efficiency of the DTAB/SDS mixt. and in the phase behavior of the mixts. CTAB and SHS can be mixed in a 1:1 ratio without pptn., forming both small, unilamellar and large, multilamellar vesicles. In DTAB/SDS mixts., however, pptn. of the cationic surfactant occurs for a mole fraction of DTAB (x) between 0.3 and 0.7, while both vesicles and large bilayer fragments are formed for x = 0.8. The excess of DTAB in the x = 0.8 mixt. results in the solubilization of the vesicles by DTAB micelles close to the cmc of pure DTAB. A network of interconnected threadlike cylindrical micelles was found as an intermediate stage of aggregation between the vesicles and the mixed micelles. These cylindrical micelles are formed exclusively on further increasing the surfactant concn.

Keywords

sodium alkyl sulfate micelle vesicle aggregation
 alkyltrimethyl ammonium bromide micelle vesicle aggregation
 decarboxylation nitrobenzisoxazole carboxylate micelle vesicle
 catalyst

Index Entries

Decarboxylation catalysts
 Decarboxylation kinetics
 for 6-nitrobenzisoxazole-3-carboxylate; self-assembly in mixts. of
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 Aggregation
 Anionic surfactants
 Cationic surfactants
 Micelles
 Micellization enthalpy
 Vesicles (colloidal)
 Quaternary ammonium compounds, reactions
 self-assembly in mixts. of sodium alkyl sulfates and alkyltrimethyl
 ammonium bromides and aggregation behavior and
 catalytic properties
 28691-50-1
 decarboxylation of; self-assembly in mixts. of sodium alkyl sulfates
 and alkyltrimethyl ammonium bromides and aggregation
 behavior and catalytic properties
 57-09-0
 151-21-3, reactions
 1119-94-4
 18981-98-1
 self-assembly in mixts. of sodium alkyl sulfates and alkyltrimethyl
 ammonium bromides and aggregation behavior and
 catalytic properties

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127:184340

Curable polymeric underfill composition for integrated circuits.
 Todd, Michael G. (Ford Motor Co., USA). U.S. US 5654081 A 5 Aug 1997, 5 pp. (United States of America). CODEN: USXXAM. CLASS: ICM: B32B009-00. NCL: 428209000. APPLICATION: US 95-498207 5 Jul 1995. DOCUMENT TYPE: Patent CA Section: 76 (Electric Phenomena) Section cross-reference(s): 38
 In producing an integrated circuit assembly, an IC device is metallurgically bonded to a supporting substrate. The mounting of the IC device to the substrate also includes a polymeric underfill body adhesively bonding the IC device to the substrate. The polymeric underfill body is formed of a curable underfill compn. comprising cycloaliph. epoxy resin, anhydride curing agent for the epoxy resin, amine catalyst, and a minor amt. (0.05-5.0 wt.%) of alkyl- or phenyl-substituted imidazole. The imidazole component may act as a catalyst, as used with a known amine catalyst for the polymn. of the epoxy resin with the anhydride curing agent. The polymeric underfill body has an improved glass transition temp. and improved coeff. of thermal expansion to provide a good thermal stress cycling life for the integrated circuit assembly.

Keywords

curable polymeric underfill compn integrated circuit

Index Entries

Epoxy resins, uses
 alicyclic; curable polymeric underfill compn. for integrated circuits contg.
 Crosslinking agents
 anhydride; curable polymeric underfill compn. for integrated circuits contg.
 Amines, uses
 catalysts; curable polymeric underfill compn. for integrated circuits contg.
 Integrated circuits
 curable polymeric underfill compn. for
 103-83-3
 catalyst; curable polymeric underfill compn. for integrated circuits contg.
 616-47-7
 670-96-2
 693-98-1
 822-36-6
 931-36-2
 1739-84-0
 25085-98-7
 curable polymeric underfill compn. for integrated circuits contg.
 85-42-7
 curing agent; curable polymeric underfill compn. for integrated circuits contg.

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126:131643

An Approach toward the Illudin Family of Sesquiterpenes Using the Tandem Cyclization-Cycloaddition Reaction of Rhodium Carbenoids.
 Padwa, Albert; Curtis, Erin A.; Sandanayaka, Vincent P. (Department of Chemistry, Emory University, Atlanta, GA 30322, USA). J. Org. Chem., 62(5), 1317-1325 (English) 1997 American Chemical Society CODEN: JOCEAH. ISSN: 0022-3263. DOCUMENT TYPE: Journal

CA Section: 30 (Terpenes and Terpenoids)

The Rh(II)-catalyzed reaction of 1-acetyl-1-(diazoacetyl)cyclopropane with 5,5-dimethylcyclo-2-penten-1-one afforded the cycloadduct I, the product of a 1,3-dipolar cycloaddn., in high yield. The reaction involves formation of a rhodium carbenoid and subsequent transannular cyclization of the electrophilic carbon onto the adjacent keto group to generate a five-membered cyclic carbonyl ylide which undergoes a subsequent 1,3-dipolar cycloaddn. reaction. The regiochem. results encountered can be rationalized on the basis of FMO considerations. Treatment of I with p-toluenesulfonic acid results in loss of water followed by a subsequent acid-catalyzed cyclopropyl ketone rearrangement to give dihydrobenzofuran II. The product distribution derived from the SmI2-induced redn. of the dipolar cycloadduct was found to depend on the reaction conditions. Under kinetic conditions, the redn. resulted in opening of the cyclopropyl ring adjacent to the carbonyl group. However, under thermodyn. conditions, cleavage of the oxy bridge corresponded to the major pathway. The cycloaddn.-redn. protocol provides a rapid assembly of the basic core unit of ptaquilosin having most of the functionality in place. Generation of a carbanion adjacent to the oxy bridge leads to opening of the oxabicyclic ring system in a highly regioselective manner. A short synthesis of (\pm)-illudin M and the closely related isodehydroilludin M is described in which the key step involves a dipolar cycloaddn. using a carbonyl ylide.

Keywords

illudin M synthesis rhodium catalyst cyclization
cycloaddn rhodium catalyst illudin M synthesis
sesquiterpene synthesis cyclization cycloaddn rhodium catalyst
ptaquilosin synthesis cyclization cycloaddn rhodium catalyst
isodehydroilludin M synthesis rhodium catalyst cyclization

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Sesquiterpenes
illudin; synthetic approach toward the illudin sesquiterpenes using
the tandem cyclization-cycloaddn. reaction of rhodium
carbenoids
Cyclization catalysts
Cycloaddition reaction catalysts
synthetic approach toward the illudin sesquiterpenes using the
tandem cyclization-cycloaddn. reaction of rhodium
carbenoids
15956-28-2
124818-28-6
824-79-3
133374-49-9
155853-67-1
155853-69-3
155853-73-9
171924-92-8
171925-06-7
185106-43-8
185106-47-2
153257-13-7
163809-47-0
185106-44-9
185106-45-0
185106-48-3
185106-49-4
185106-50-7
185106-51-8
185106-52-9

185106-53-0
 185106-54-1
 185106-55-2
 185106-56-3
 185106-58-5
 19903-66-3
 155853-77-3
 155853-79-5
 155853-82-0
 163809-49-2
 178423-93-3
 185106-36-9
 185106-37-0
 185106-38-1
 185106-39-2
 185106-40-5
 185106-41-6
 185106-42-7
 185106-46-1
 185106-57-4

synthetic approach toward the illudin sesquiterpenes using the
 tandem cyclization-cycloaddn. reaction of rhodium
 carbenoids

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126:93867

Butting monoliths in catalytic converters.

Kuisell, Richard C. (Delphi Energy and Engine Management Systems,
 USA). Soc. Automot. Eng., [Spec. Publ.] SP, SP-1173 (Cold-Start
 Emission Control and Catalyst Technologies), 135-140 (English) 1996
 Society of Automotive Engineers CODEN: SAESA2. ISSN:

0099-5908. DOCUMENT TYPE: Journal CA Section: 59 (Air Pollution
 and Industrial Hygiene) Section cross-reference(s): 57, 67

Most catalytic converter designs use monolith type catalyst supports.
 Many of these designs use >1 monolith because of different catalyst
 loadings or constraints on the manuf. or coating of long monoliths.
 Usually a space exists between the monoliths. Traditional thinking has
 been that spacing was necessary for enhanced emissions, reduced
 flow restriction, or concerns about the phys. integrity of the monoliths.
 The concept of eliminating the space, and butting the monoliths
 together as a viable converter assembly technique is discussed.
 Major benefits include simplified assembly, reduced no. of
 components and cost, and improved durability, with no major affect on
 emissions or flow restriction.

Keywords

monolith butting catalytic converter exhaust gas
 emission control exhaust butted monolith catalyst
 cordierite ceramic monolith catalyst exhaust emission

Index Entries

Catalytic reactors

Ceramics

Design

Exhaust gases (engine)

Hydrocarbons, processes

design and performance of butted monolith catalysts in exhaust gas
 catalytic converters

Catalysts

monolithic, ceramic; design and performance of butted monolith
 catalysts in exhaust gas catalytic converters

1302-88-1

630-08-0, processes
 11104-93-1, processes
 design and performance of butted monolith catalysts in exhaust gas
 catalytic converters

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126:7743

Mesoporous Titanosilicate Molecular Sieves Prepared at Ambient
 Temperature by Electrostatic and Neutral Assembly Pathways: A
 Comparison of Physical Properties and Catalytic Activity for
 Peroxide Oxidations.

Zhang, Wenzhong; Froeba, Michael; Wang, Jialiang; Tanev, Peter T.;
 Wong, Joe; Pinnavaia, Thomas J. (Department of Chemistry, Michigan
 State University, East Lansing, MI 48824, USA). J. Am. Chem. Soc.,
 118(38), 9164-9171 (English) 1996 American Chemical Society
 CODEN: JACSAT. ISSN: 0002-7863. DOCUMENT TYPE: Journal
 CA Section: 25 (Benzene, Its Derivatives, and Condensed Benzenoid
 Compounds)

Hexagonal meso porous titanosilicates with distinguishable framework
 charges and textural forms, namely, Ti-MCM-41 and Ti-HMS, were
 prepd. at ambient temp. by electrostatic and neutral assembly
 processes, resp. Titanium incorporation at the 2 mol% level for both
 materials was accompanied by increases in lattice parameters and
 wall thicknesses, but the framework pore sizes remained unaffected.
 Crosslinking of the anionic framework of as-synthesized Ti-substituted
 MCM-41 prepd. by electrostatic S+I- and S+X-I+ assembly pathways
 (where S+ is a quaternary ammonium surfactant and I- and I+ are ionic
 silicon precursors) was enhanced significantly by Ti substitution, as
 judged by 29Si MAS NMR. The neutral framework of as-synthesized
 Ti-HMS formed by S°I° assembly (where S° is a primary amine and I°
 is a neutral silicon precursor) exhibited the same high degree of
 crosslinking as the unsubstituted silica analog. UV-vis and XANES
 spectra for the calcined forms of Ti-MCM-41 and Ti-HMS indicated (i)
 the presence of site-isolated Ti species in the framework, (ii)
 predominantly tetrahedral coordination for Ti, along with some
 rehydrated five- and six-coordinated sites, and (iii) Ti siting that was
 virtually independent of the framework assembly pathway. All meso
 porous mol. sieves exhibited catalytic activities superior to that of
 titanium silicalite for the liq. phase peroxide oxidns. of Me methacrylate,
 styrene, and 2, 6-di-tert-butylphenol. The exceptional catalytic activity in
 the case of Ti-HMS, esp. toward larger substrates, was attributable to
 the small crystallite size and complementary textural mesoporosity that
 facilitates substrate access to framework Ti sites.

Keywords

zeolite synthetic titanosilicate prepn oxidn catalyst
 styrene oxidn zeolite synthetic titanosilicate prepn
 phenol zeolite synthetic titanosilicate prepn

Index Entries

Titanium silicalite
 TS-1; prepn. of meso porous titanosilicate mol. sieves as oxidn.
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 Molecular sieves
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 oxidn. catalysts for small org. mols.
 Epoxidation catalysts
 Alcohols, reactions
 Alkanes, reactions
 prepn. of meso porous titanosilicate mol. sieves as oxidn. catalysts
 for small org. mols.
 Zeolites (synthetic), preparation

titanosilicate; prepn. of meso porous titanosilicate mol. sieves as oxidn. catalysts for small org. mols.
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 80-62-6
 100-42-5, reactions
 128-39-2
 3087-36-3
 600-22-6
 prepn. of meso porous titanosilicate mol. sieves as oxidn. catalysts for small org. mols.
 4499-86-9
 template; prepn. of meso porous titanosilicate mol. sieves as oxidn. catalysts for small org. mols.

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126:149672
 Generation of hydrogen peroxide in a shorted fuel cell.
 Webb, Steven P.; McIntyre, James A. (Central Research Development, Dow Chemical Co., Midland, MI 48674, USA). Int. Forum Electrolysis Chem. Ind., 10th, 213-225. Electrosynthesis: Lancaster, N. Y. (English) 1996. CODEN: 63WBA6. DOCUMENT TYPE: Conference CA
 Section: 72 (Electrochemistry) Section cross-reference(s): 52, 67
 The development is described of a scalable, segmented-flow, shorted fuel cell for the generation of > 1 wt. % H₂O₂ with selectivities of 20 to 70%. This result stems from identification of effective catalysts for generation of peroxide, application of these catalysts to an ionomer membrane and operation of the membrane electrode assembly at high pressure in a 2-phase reactor. Gold and zinc and zinc oxide are some of the catalysts discussed.

Keywords

generation hydrogen peroxide shorted fuel cell
 gold cathode catalyst hydrogen peroxide generation
 zinc cathode catalyst hydrogen peroxide generation
 oxide zinc catalyst hydrogen peroxide generation

Index Entries

Electrochemical reduction catalysts
 for hydrogen peroxide generation in shorted fuel cell
 Fuel cells
 generation of hydrogen peroxide in shorted fuel cell
 Electrochemical reduction
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 1314-13-2, uses
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 7440-66-6, uses
 cathode catalyst in generation of hydrogen peroxide in shorted fuel cell
 7782-44-7, properties
 electrochem. redn. and generation of hydrogen peroxide in shorted fuel cell
 7722-84-1, properties
 generation of hydrogen peroxide in shorted fuel cell

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126:64387
 Method for forming honeycomb structure for catalyst carrier of exhaust systems.
 Ishikawa, Yasushi; Ootani, Tadayuki (Shinnippon Seitetsu Kk, Japan). Jpn. Kokai Tokkyo Koho JP 08257413 A2 8 Oct 1996 Heisei, 5 pp. (Japan). CODEN: JKXXAF. CLASS: ICM: B01J035-04. ICS:

B01D053-86; B21D047-00; B23K011-00; F01N003-20; F01N003-28.
 APPLICATION: JP 95-66359 24 Mar 1995. DOCUMENT TYPE:
 Patent CA Section: 59 (Air Pollution and Industrial Hygiene)
 The method comprises assembling a corrugated ribbon and a flat
 ribbon into a honeycomb configuration, coiling the assembly, and
 resistance welding by using 2 electrodes in contact with the flat ribbon.
 The honeycomb assembly is coiled by using 3 rolls arranged at the
 circumference of the cylindrical honeycomb structure.

Keywords

honeycomb structure catalyst carrier exhaust system

Index Entries

Exhaust systems (engine)
 Honeycomb structures
 Resistance welding
 forming honeycomb structure for catalyst carrier of exhaust
 systems by coiling and resistance welding

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127:331333

Methyltrioxorhenium supported on silica tethered with polyethers as
 catalyst for the epoxidation of alkenes with hydrogen peroxide.
 Neumann, Ronny; Wang, Tie-Jun (Casali Institute of Applied Chemistry,
 Graduate School of Applied Science, The Hebrew University of
 Jerusalem, Jerusalem 91904, Israel). Chem. Commun. (Cambridge),
 (19), 1915-1916 (English) 1997 Royal Society of Chemistry CODEN:
 CHCOFS. ISSN: 1359-7345. DOCUMENT TYPE: Journal CA
 Section: 27 (Heterocyclic Compounds (One Hetero Atom))
 Methyltrioxorhenium has been supported on silica functionalized with
 polyether tethers; in the absence of an org. solvent, this assembly
 catalyzed the epoxidn. of alkenes with 30% aq. H2O2 in high selectivity
 compared to the ring opening products obsd. in homogeneous media.

Keywords

epoxidn olefin methyltrioxorhenium silica polyether tether

Index Entries

Epoxidation catalysts
 Polyethers, uses
 Alkenes, reactions
 methyltrioxorhenium supported on silica tethered with polyethers as
 catalyst for epoxidn. of alkenes
 78-10-4, reaction product with polyalkylene glycol Me
 [(trimethoxysilyl)phenyl]methyl ethers
 70197-13-6
 198079-91-3, reaction product with tetraethoxysilane
 198079-92-4, reaction product with tetraethoxysilane
 95-13-6
 100-42-5, reactions
 110-83-8, reactions
 111-66-0
 498-66-8
 627-97-4
 9004-74-4
 15870-10-7
 24413-04-5
 37286-64-9
 96-09-3
 278-74-0

286-20-4
768-22-9
2984-50-1
3776-34-9
53907-75-8

methyltrioxorhenium supported on silica tethered with polyethers as catalyst for epoxidn. of alkenes

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127:323192

Porous clay heterostructures (PCH) as acid catalysts.

Galarneau, Anne; Barodawalla, Anis; Pinnavaia, Thomas J.
(Department of Chemistry and Center for Fundamental Materials
Research, Michigan State University, East Lansing, MI 48824, USA).
Chem. Commun. (Cambridge), (17), 1661-1662 (English) 1997 Royal
Society of Chemistry CODEN: CHCOFS. ISSN: 1359-7345.

DOCUMENT TYPE: Journal CA Section: 67 (Catalysis, Reaction
Kinetics, and Inorganic Reaction Mechanisms) Section

cross-reference(s): 23

Porous clay heterostructures formed by surfactant assembly of open
framework silica in the galleries of a smectite clay represent a new
family of solid acid catalysts, as evidenced by the selective dehydration
of 2-methylbut-3-yn-2-ol to 2-methylbut-3-yn-1-ene.

Keywords

porous clay heterostructure acid catalyst
silica smectite clay acid catalyst
methylbutynol dehydration catalyst silica smectite clay

Index Entries

Dehydration catalysts

for 2-methylbut-3-yn-2-ol; porous clay heterostructures (PCH) as
acid catalysts

Acids, uses

Clays, uses

Intercalation compounds

porous clay heterostructures (PCH) as acid catalysts

115-19-5

dehydration of; porous clay heterostructures (PCH) as acid
catalysts

7631-86-9, uses

197666-84-5

57-09-0

78-10-4

porous clay heterostructures (PCH) as acid catalysts

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127:235781

(Urethane-modified) polyester-based coating compositions and their
film formation.

Nagao, Goro; Suzuki, Nobuyuki; Yamamoto, Takeshi (Nippon Paint
Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 09208893 A2 12 Aug
1997 Heisei, 12 pp. (Japan). CODEN: JKXXAF. CLASS: ICM:

C09D167-00. ICS: B05D001-36; B05D007-24; C09D007-12;

C09D175-06. APPLICATION: JP 96-37119 31 Jan 1996.

DOCUMENT TYPE: Patent CA Section: 42 (Coatings, Inks, and
Related Products)

Title compns., having good adhesion on both metals and plastics,
comprise 100 parts 50-95% (urethane-modified) polyesters having
no.-av. mol. wt. (Mn) of 500-3,000, OH value of 80-200, and acid value
of 5-20 and 5-50% methyl/butyl-etherated and/or butyl-etherated

methylol melamines, 1-20 parts polyfunctional isocyanates and/or maleimides, and 0.1-3% (based on total polymers and polyfunctional compds.) curing catalysts. An assembly of an electrodeposited and phosphated steel part and a degreased polyoxyphenylene/polyamide resin part was coated with a compn. contg. adipic acid (I)-isophthalic acid-neopentyl glycol-trimethylolpropane (II) copolymer, I-II-Desmodur W-Ester Diol 204 copolymer, Cymel 202, U-Van 20N60, BT 200, Epikote 1001, and a benzenesulfonate catalyst, baked, coated with a colored base and clear top compn., and baked to form an assembly showing good water-resistant coating adhesion.

Keywords

polyurethane polyester middle coating automobile
metal plastic assembly adhesion polyester coating
melamine resin polyisocyanate polymaleimide polyester coating

Index Entries

Automobile bodies
Water-resistant coatings
Polyester-polyurethanes
Polyesters, uses
Metals, miscellaneous
Polyamides, miscellaneous
Polyoxyphenylenes
Aminoplasts
(urethane-modified) polyester middle coating compns. with good adhesion to metals and plastics
195207-67-1
195207-72-8
9003-08-1
(urethane-modified) polyester middle coating compns. with good adhesion to metals and plastics

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127:86671

Steady-state catalytic C-C bond formation on reduced TiO₂ surfaces. Lusvardi, Victor S.; Pierce, Keith G.; Barteau, Mark A. (Center Catalytic Science Technology, Department Chemical Engineering, University Delaware, Newark, DE 19716, USA). J. Vac. Sci. Technol., A, 15(3, Pt. 2), 1586-1591 (English) 1997 American Institute of Physics CODEN: JVTAD6. ISSN: 0734-2101. DOCUMENT TYPE: Journal CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms) Section cross-reference(s): 51
Previous temp. programmed desorption (TPD) expts. on reduced TiO₂ (001) surfaces have demonstrated that alkynes are converted to the corresponding arom. products with high selectivity. This reaction also represents the first example of catalytic assembly of carbon-carbon bonds on a metal oxide surface in ultrahigh vacuum. Although the catalytic formation of carbon-carbon bonds on single crystal surfaces is a rarity, many important catalytic processes involve carbon-carbon bond formation, and it is therefore worthwhile to consider how such reactions might be studied directly using the tools of surface science. Steady-state expts. involving the prodn. of trimethylbenzene from methylacetylene at low pressure (10⁻⁹-10⁻⁵ mbar) conditions have demonstrated multiple turnovers of the catalyst and no significant catalyst deactivation at temps. between 290 and 500 K. A four-step kinetic model is proposed, which contains three nonactivated steps for alkyne adsorption/reaction to form the arom., followed by the final step, arom. desorption. This model captures the measured temp. and pressure dependence of the reaction rate.

Keywords

carbon bond reduced titania vacuum catalysis
alkyne conversion arom hydrocarbon titania catalyst

Index Entries

Bond

carbon-carbon; steady-state catalytic C-C bond formation on
reduced TiO₂ surfaces

Aromatization

of alkyne; steady-state catalytic C-C bond formation on reduced
TiO₂ surfaces

Aromatic hydrocarbons, preparation

prepn. of, from alkynes; steady-state catalytic C-C bond formation
on reduced TiO₂ surfaces

Aromatization catalysts

steady-state catalytic C-C bond formation on reduced TiO₂
surfaces

Vacuum

ultrahigh; steady-state catalytic C-C bond formation on reduced
TiO₂ surfaces

25551-13-7

formation of, from methylacetylene; steady-state catalytic C-C bond
formation on reduced TiO₂ surfaces

74-99-7

sorption/aromatization of; steady-state catalytic C-C bond
formation on reduced TiO₂ surfaces

13463-67-7, uses

steady-state catalytic C-C bond formation on reduced TiO₂
surfaces

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127:81293

Intrazeolite assembly of a chiral manganese salen epoxidation
catalyst.

Ogunwumi, Steven B.; Bein, Thomas (Dep. Chem., Purdue Univ., West
Lafayette, IN 47907, USA). Chem. Commun. (Cambridge), (9),

901-902 (English) 1997 Royal Society of Chemistry CODEN:

CHCOFS. ISSN: 1359-7345. DOCUMENT TYPE: Journal CA

Section: 27 (Heterocyclic Compounds (One Hetero Atom))

Asym. manganese salen epoxidn. catalysts are assembled and
trapped in a multistep synthesis in the cages of zeolite EMT; these
heterogeneous catalysts produce high enantiomeric excess in the
epoxidn. of arom. alkenes with NaOCl.

Keywords

zeolite catalyst prepn epoxidn arom alkene
manganese zeolite catalyst epoxidn arom alkene

Index Entries

Epoxidation

Epoxidation catalysts

Zeolites (synthetic), uses

epoxidn. of arom. alkenes using manganese salen-zeolite catalysts

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170422-14-7

191727-95-4

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100-42-5, reactions

563-79-1

766-90-5

873-66-5
20439-47-8
21436-03-3
21501-76-8
41715-31-5
4518-66-5
5076-20-0
14212-53-4
20780-54-5

epoxidn. of arom. alkenes using manganese salen-zeolite catalysts

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126:330307

First Enantioselective Catalytic Diels-Alder Reaction of Dienes and Acetylenic Aldehydes: Experimental and Theoretical Evidence for the Predominance of Exo-Transition Structure.

Ishihara, Kazuaki; Kondo, Shoichi; Kurihara, Hideki; Yamamoto, Hisashi; Ohashi, Shigenori; Inagaki, Satoshi (Graduate School of Engineering, Nagoya University, Nagoya 464-01, Japan). J. Org. Chem., 62(10), 3026-3027 (English) 1997 American Chemical Society
CODEN: JOCEAH. ISSN: 0022-3263. DOCUMENT TYPE: Journal

CA Section: 22 (Physical Organic Chemistry)

The authors report not only the first example of an enantioselective Diels-Alder reaction of dienes and acetylenic aldehydes catalyzed by chiral Lewis acids, but also an ab initio study which supports the predominance of the exo-transition structure, which clarifies the origin of the enantioselectivity obsd. upon catalysis. Exo-endo selectivity of the transition structure in the reaction of acetylenic dienophiles has not been previously investigated since the adducts produced via exo- or endo-transition-state assembly are identical diastereomerically. Chiral Lewis acids which we previously developed for the Diels-Alder reaction of dienes and α,β -enals, are also effective for the reaction of prochiral dienes and acetylenic aldehydes: a transfer of asymmetry from a chiral catalyst to a diene is efficiently originated through the asym. recognition of the carbonyl face of the acetylenic dienophile by the catalyst, since the preference for exo-transition-state assembly is present regardless of the steric factors of the Lewis acid.

Keywords

Diels Alder cycloalkadiene acetylenic aldehyde enantioselective
MO enantioselective Diels Alder

Index Entries

Aldehydes, reactions

acetylenic; enantioselective Diels-Alder reaction of dienes and acetylenic aldehydes catalyzed by chiral Lewis acids

Lewis acids

chiral; enantioselective Diels-Alder reaction of dienes and acetylenic aldehydes catalyzed by chiral Lewis acids

FMO (molecular orbital)

Potential energy surface

RHF (molecular orbital)

Stereoselective Diels-Alder reaction

Transition state structure

enantioselective Diels-Alder reaction of dienes and acetylenic aldehydes catalyzed by chiral Lewis acids

Alkynes

formyl; enantioselective Diels-Alder reaction of dienes and acetylenic aldehydes catalyzed by chiral Lewis acids

7637-07-2, uses

153254-17-2

154724-40-0

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 542-92-7, reactions
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 29797-09-9
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 189346-01-8
 189346-02-9
 41502-60-7
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 189345-93-5
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 189345-97-9
 189345-98-0
 189346-00-7
 189346-03-0
 189346-04-1
 189346-05-2
 189346-06-3

enantioselective Diels-Alder reaction of dienes and acetylenic aldehydes catalyzed by chiral Lewis acids

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126:112297

A convenient high yield synthesis of 2,2':6',2'':6'',2''':6''',2''''-sexipyridine and helical transition-metal complexes of substituted sexipyridines. Chotalia, Rohit; Constable, Edwin C.; Neuburger, Markus; Smith, Diane R.; Zehnder, Margareta (University Chemical Laboratory, Cambridge CB2 1EW, UK). J. Chem. Soc., Dalton Trans., (22), 4207-4216 (English) 1996 Royal Society of Chemistry CODEN: JCDTBI. ISSN: 0300-9246. DOCUMENT TYPE: Journal CA Section: 78 (Inorganic Chemicals and Reactions) Section cross-reference(s): 72, 75 2,2':6',2'':6'',2''':6''',2''''-Sexipyridine (spy) was synthesized in high yield by the coupling of 6-bromo-2,2':6',2''-terpyridine with a Ni(0) reagent, followed by demetalation of the resultant double-helical [Ni2(spy)2]4+ complex with KCN. To probe the effects of substitution of spy upon helication processes, the substituted analogs 4',4''-bis(methylsulfanyl)-2,2':6',2'':6'',2''':6''',2''''-sexipyridine (msspy), 4',4''-bis(diphenyl)-2,2':6',2'':6'',2''':6''',2''''-sexipyridine (pspy) and 4',4''-bis(4-tert-butylphenyl)-2,2':6',2'':6'',2''':6''',2''''-sexipyridine (tbspy) were also prep'd. and studied. The reaction of each of these compds. with transition-metal ions capable of adopting an octahedral geometry results in the self-assembly of dinuclear double-helical complexes [M2L2]4+ [M = Fe(II), Co(II), Ni(II), Cu(II), Zn(II), Cd(II) or Hg(II); L = spy, msspy, pspy or tbspy]; the double-helical topol. of the Zn complex of pspy was confirmed by a crystal-structure anal. of [Zn2(pspy)2](PF6)4·2MeCN·2H2O [space group P4221, a 15.518(2), c 18.443(1) Å, R = 0.0638, R' = 0.0735].

Keywords

crystal structure zinc diphenylsexipyridine dinuclear helical transition metal sexipyridine substituted dinuclear prep'n helical transition metal sexipyridine substituted prep'n electrochem potential cobalt nickel sexipyridine substituent

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14322-49-7
catalyst for prepn. of sexipyridines in solns. contg.
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150263-40-4
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for synthesis of sexipyridine and helical transition metal complexes
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150953-25-6
185897-55-6
185897-57-8
185897-58-9
185897-60-3
185897-62-5
185897-64-7
185897-66-9
185897-68-1
185897-70-5
185897-72-7
185897-74-9
185897-76-1
185897-80-7
185897-82-9
185897-84-1
185897-86-3
185897-89-6
185897-92-1
185897-95-4
185897-98-7

synthesis of sexipyridine and helical transition metal complexes of substituted sexipyridines

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126:34163

Distributor assembly for multi-bed down-flow catalytic reactors in petroleum refining processes.

Stangeland, Bruce C.; Parimi, Krishniah; Cash, Dennis R. (Chevron U.S.A. Inc., USA). PCT Int. Appl. WO 9634683 A1 7 Nov 1996, 19 pp.

DESIGNATED STATES: W: CA, CN, JP, KR, RU, SG; RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: B01J008-04. APPLICATION: WO 96-IB544 19 Apr 1996. PRIORITY:

US 95-435564 5 May 1995. DOCUMENT TYPE: Patent CA Section:

51 (Fossil Fuels, Derivatives, and Related Products)

A multi-bed, down-flow reactor includes several distributor assemblies each having a centrally located mixing chamber and an annular collecting and mixing trough surrounding the mixing chamber. The mixing chamber has an inlet at one side thereof, an outlet in its bottom wall, and a quench gas inlet in its top wall above the outlet. A divider wall traverses the annular trough adjacent to the inlet to cause the pool of liq. collected in the trough to flow in a circular pattern around the mixing chamber to the inlet. This ensures that the liq. circulating through the trough is well mixed with the liq. raining down from the catalyst bed. Turbulent and spiraling flow patterns generated within the chamber further mix. the liq. and gas and entrain quench gas in the liq. and gas stream.

Keywords

petroleum refining catalyst reactor distributor

Index Entries

Petroleum refining catalysts

Petroleum refining

distributor assembly for multi-bed down-flow catalytic reactors in petroleum refining processes

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127:320789

Development of high performance solid polymer electrolyte water electrolyzer in WE-NET.

Yamaguchi, Mikimasa; Okisawa, Kayoko; Nakanori, Takahiro (New Energy Laboratory, Fuji Electric Corporate Research Development Ltd., Yokosuka City, Japan). Proc. Intersoc. Energy Convers. Eng. Conf., 32nd, 1998-1999 (English) 1997 Society of Automotive Engineers CODEN: PIECDE. ISSN: 0146-955X. DOCUMENT

TYPE: Journal CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 49

Commissioned to execute subtask 4, "Development of Hydrogen Prodn. Technologies" as a part of the Ministry of International Trade and Industry's "Technologies for an International Clean Energy Network using Hydrogen Conversion Project" (i.e. WE-NET), Fuji Elec. Corporate Research and Development, Ltd. has been developing technologies for high performance solid polymer electrolyte water electrolyzers. In term of tech. features, Fuji Elec.'s technol. approach calls for membrane-electrode assemblies to be formed by a hot-press method. In the development activities, diverse types of current collectors were test-produced by changing coating materials and methods, and various types of 50 cm² membrane-electrode assemblies were fabricated by changing anode catalyst species, membrane species and catalyst loading amt. Based on the results of

the performance evaluations of those sample we have obtained a test-produced high performance electrolyzer with platinum-plated titanium fiber plate, gold-plated stainless steel fiber plate and a membrane-electrode assembly composed of iridium dioxide, platinum black and perfluorocarbon sulfonic acid membrane, which registered 1.53 V of cell voltage and 99.2% of current efficiency and 95.8% of energy efficiency for a c.d. of 1 A/cm² at a temp. of 80°C, under atm. pressure.

Keywords

water electrolyzer solid polymer electrolyte hydrogen

Index Entries

Water electrolysis

development of high performance solid polymer electrolyte water electrolyzer in WE-NET

Stainless steel fibers

gold-plated, cathode collector; development of high performance solid polymer electrolyte water electrolyzer in WE-NET

Electrolytic cells

solid polymer electrolyte; development of high performance solid polymer electrolyte water electrolyzer in WE-NET

Metallic fibers

titanium, platinum-plated, anode collector; development of high performance solid polymer electrolyte water electrolyzer in WE-NET

1312-46-5

7439-88-5, uses

7440-18-8, uses

12030-49-8

12036-10-1

12036-35-0

anode catalysts; development of high performance solid polymer electrolyte water electrolyzer in WE-NET

1333-74-0, preparation

7782-44-7, preparation

development of high performance solid polymer electrolyte water electrolyzer in WE-NET

7440-57-5, uses

stainless steel fibers plated with, cathode collector; development of high performance solid polymer electrolyte water electrolyzer in WE-NET

7440-06-4, uses

titanium fibers plated with, anode collector; development of high performance solid polymer electrolyte water electrolyzer in WE-NET

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127:296182

Membrane electrode assemblies for polymer electrolyte fuel cells.

Kawahara, K.; Haga, T.; Suzuki, T.; Asaoka, T. (Electrochemistry and Battery Laboratory, Toyota Central R&D Labs., Inc., Nagakute 480-11, Japan). EVS-13, Int. Electr. Veh. Symp., 13th, Volume 2, 713-717. Japan Electric Vehicle Association: Tokyo, Japan. (English) 1996.

CODEN: 65CBAM. DOCUMENT TYPE: Conference CA Section: 52

(Electrochemical, Radiational, and Thermal Energy Technology)

Polymer electrolyte fuel cells (PEFCs) are expected as the prime candidate for transportation applications. High power and high efficiency PEFCs are strongly demanded for the applications and therefore high performance membrane electrode assemblies (MEAs) are required to meet such demands. MEAs with catalyst layers of different structure and compn. were fabricated and their performance

was evaluated with a small single cell under 1-2 atm of hydrogen/air. The simulation of the PEFC performance was also carried out taking account of water distribution in the electrolyte. Important factors for improving fuel cell performance are discussed based on these results.

Keywords

electrode assembly polymer electrolyte fuel cell
PEFC electrode assembly elec vehicle

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Electric current-potential relationship
Electric vehicles
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Carbon black, uses
membrane electrode assemblies for polymer electrolyte fuel cells
Fuel cells
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polymer-membrane; membrane electrode assemblies for polymer electrolyte fuel cells
7440-06-4, uses
77950-55-1
1333-74-0, reactions
membrane electrode assemblies for polymer electrolyte fuel cells

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127:226562

Applications of x-ray absorption fine structure to catalysts and model surfaces.

Iwasawa, Y. (Department of Chemistry, Graduate School of Science, The University of Tokyo, Hongo 113, Japan). J. Phys. IV, 7(C2, X-Ray Absorption Fine Structure, Vol. 1), 67-81 (English) 1997 Editions de Physique CODEN: JPICEI. ISSN: 1155-4339. DOCUMENT TYPE: Journal; General Review CA Section: 73 (Optical, Electron, and Mass Spectroscopy and Other Related Properties) Section
cross-reference(s): 66, 67

A review with 115 refs. Perhaps the most important attribute for x-ray absorption fine structure (XAFS) in the characterization of supported catalysts and model surfaces is the in-situ study of working catalysts and surfaces. This paper discusses polarization-dependent total-reflection fluorescence XAFS (PTRF-XAFS), in-situ characterization of catalytic phenomena by EXAFS (e.g. niobium on silica for ethanol dehydration, carbon monoxide hydrogenation using a ruthenium cluster), in-situ characterization of anisotropic or asym. structures using PTRF-XAFS (e.g. cobalt oxides on alpha-alumina, platinum clusters on alumina, vanadium oxides on zirconia, and molybdenum oxides on titania), and future prospects of PTRF-XAFS. An organized assembly of knowledge about the structures and electronic states of active metal and metal-oxide sites integrated over both powder catalysts and model surfaces in both static and dynamic (working) states is indispensable, not only for the understanding or the genesis of solid catalysis but also for the optimization and development of new catalytic and advanced materials, which would allow us to move toward the ultimate goal of rational catalyst design.

Keywords

metal oxide catalyst surface XAFS review
x ray absorption fine structure review

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EXAFS spectra
in-situ characterization of catalytic phenomena using
Catalysts
Surface state
XAFS spectra
Oxides (inorganic), properties
Transition metals, properties
polarization-dependent total-reflection fluorescence x-ray
absorption fine structure (PTRF-XAFS) spectra of
supported catalysts and model surfaces

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127:87368

Asbestos-free cathode element suitable for electrolysis of sodium chloride solution.

Bacquet, Gerard; Kuntzburger, Frederic (Rhone-Poulenc Chimie; Bacquet, Gerard; Kuntzburger, Frederic, Fr.). PCT Int. Appl. WO 9724474 A1 10 Jul 1997, 20 pp. DESIGNATED STATES: W: AL, AU, BA, BB, BG, BR, CA, CN, CU, CZ, EE, GE, HU, IL, IS, JP, KP, KR, LC, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, US, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: C25B011-04. ICS: C25B011-03. APPLICATION: WO 96-FR2091 27 Dec 1996. PRIORITY: FR 95-15712 29 Dec 1995. DOCUMENT TYPE: Patent CA Section: 72 (Electrochemistry) Section cross-reference(s): 47, 49

This invention covers a cathode element free from asbestos fibers that can be obtained by deposition after filtration through a porous medium of an aq. suspension comprising elec. conductive fibers, at least 1 cationic polymer, at least 1 electrocatalytic agent, at least 1 pore-forming agent and at least 1 binder selected from among the fluoropolymers. The invention also covers a method for prepg. such a cathode element for obtaining an alkali metal hydroxide soln. by electrolysis of the corresponding chloride soln. Two examples are given for the prepn. of a fibrous sheet comprising a cationic polymer as well as cellulose fibers. A suspension is first made, consisting of PTFE in the form of latex, BECOFLOC cellulose fibers, cationic starch HI CAT 165, pptd. silica, carbon fibers, Triton X-100, and Raney Ni powder. Only the quantities of starch and cellulose fibers are different in the two prepgs. After agitating the suspension, it is filtered under vacuum, then plaited and laminated on an iron and steel grill. A depression is formed according to specific directions, and the assembly is then dried and consolidated by melting the fluoropolymer at 350°C. The silica is eliminated in situ in the electrolyzer by dissoln. in an alk. medium during the first hours of the electrolysis.

Keywords

cathode electrolysis alkali metal chloride soln
hydroxide alkali metal prodn electrolysis cathode
pore former cathode component chloride electrolysis
catalyst cathode component electrolysis chloride soln
cationic polymer cathode component chloride electrolysis
fluoropolymer binder cathode component chloride electrolysis
elec conductive fiber cathode chloride electrolysis
sodium chloride electrolysis hydroxide manuf cathode

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 soln. to produce NaOH in an electrolytic cell
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 metal chloride soln.
 Alkali metal hydroxides
 asbestos-free cathode element suitable for electrolysis of alkali
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 7631-86-9, uses
 9002-84-0
 9002-93-1
 in asbestos-free cathode element suitable for electrolysis of NaCl
 soln. to produce NaOH

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127:38509

Solvent-free, radiation-curable compositions for coating optical fibers,
 the coated optical fibers obtained, ribbon assemblies containing
 the optical fibers, telecommunication systems containing the
 ribbons, and solvent-free process for manufacturing the
 compositions.

Tortorello, Antony J.; Murphy, Edward J. (DSM N.V.; Tortorello, Antony
 J.; Murphy, Edward J., Neth.). PCT Int. Appl. WO 9716469 A1 9 May
 1997, 60 pp. DESIGNATED STATES: W: AL, AU, BA, BB, BG, BR,
 CA, CN, CU, CZ, EE, GE, HU, IL, IS, JP, KP, KR, LC, LK, LR, LT, LV,
 MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, US, UZ,
 VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF,
 CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML,
 MR, NE, NL, PT, SE, SN, TD, TG. (World Intellectual Property
 Organization). CODEN: PIXXD2. CLASS: ICM: C08G018-81. ICS:
 C03C025-02. APPLICATION: WO 96-NL429 31 Oct 1996.
 PRIORITY: US 95-7209 3 Nov 1995. DOCUMENT TYPE: Patent CA
 Section: 57 (Ceramics)

The compns. contain (a) a urethane oligomer having a functional group
 capable of polymg. in the presence of actinic radiation and having av.
 functionality el.2 and contg. a vinyl addn. polymer as backbone, (b) a
 urethane compd. contg. ³1 functional groups capable of polymg. in the
 presence of actinic radiation, and having av. functionality el and contg.
 a C>4- org. moiety as backbone, and (c) a reactive diluent. The
 compns. are manufd. by reacting, in the presence of a
 hydroxy-functional diluent, a 1st hydroxy-functional, ethylenically unsatd.,
 copolymerizable monomer with ³1 2nd ethylenically unsatd.,
 copolymerizable monomers to form a hydroxy-functional vinyl addn.

polymer dispersed or dissolved in the hydroxy-functional diluent, reacting the 1st monomer with at least the 2nd monomer to form a hydroxy-functional vinyl addn. polymer, dispersing or dissolving the copolymer in the hydroxy-functional diluent, and reacting the copolymer and the hydroxy-functional diluent with a monofunctional isocyanate contg. a radiation-curable functional group, all in the absence of a solvent.

Keywords

coating material optical fiber
radiation curable coating material
ribbon assembly optical fiber
telecommunication system ribbon assembly
acrylic polyurethane coating material

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acrylic polyurethane compns., solvent-free; for coating optical fibers for ribbon assemblies for telecommunication systems
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Communication
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catalyst; solvent-free, radiation-curable compns. for coating optical fibers for ribbon assemblies in telecommunication systems
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190774-97-1
190774-98-2
190774-99-3
190775-00-9
solvent-free, radiation-curable compns. for coating optical fibers for ribbon assemblies in telecommunication systems

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126:240643
Characterization of direct methanol fuel cell components by electron microscopy and x-ray microchemical analysis.
Arico, A. S.; Creti, P.; Poltarzewski, Z.; Mantegna, R.; Kim, H.; Giordano, N.; Antonucci, V. (Inst. CNR-TAE Transform. Storage Energy., Messina 98126, Italy). Mater. Chem. Phys., 47(2-3), 257-262 (English) 1997 Elsevier CODEN: MCHPDR. ISSN: 0254-0584.
DOCUMENT TYPE: Journal CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section
cross-reference(s): 38
Transmission and scanning electromicroscopy techniques were used in conjunction with X-ray microchem. anal. to investigate the structure, morphol. and compn. of direct methanol fuel cells components. Two different prepn. methods were adopted for fabrication of membrane-electrode assembly. The first was based on

a conventional method involving ionomer spreading on electrodes, the second method concerned the direct mixing of catalyst and ionomer. The latter method allowed improved electrochem. activity and cond. characteristics to be obtained. According to electron microscopy and X-ray microchem. anal., the obsd. results were attributed to an improved bonding between catalyst and ionomer and to a larger extension of three-phase reaction zone at the electrode-electrolyte interface.

Keywords

methanol fuel cell component characterization
electron microscopy fuel cell component characterization
x ray microchem analysis fuel cell

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7440-18-8, uses
7440-31-5, uses
7440-33-7, uses
7440-44-0, uses
66796-30-3
67-56-1, uses
characterization of direct methanol fuel cell components by electron microscopy and x-ray microchem. anal.

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126:204783

R&D of high performance solid polymer electrolyte water electrolyzer in WE-NET.

Yamaguchi, M.; Yagiuchi, K.; Okisawa, K. (Environment & Energy Laboratory, Fuji Electric Corporate Research and Development, Ltd., Yokosuka city 240-01, Japan). Hydrogen Energy Prog. XI, Proc. World Hydrogen Energy Conf., 11th, Volume 1, 781-786. Edited by: Veziroglu, T. Nejat. International Association for Hydrogen Energy: Coral Gables, Fla. (English) 1996. CODEN: 63WWAZ. DOCUMENT TYPE: Conference CA Section: 72 (Electrochemistry) Section cross-reference(s): 49, 67
Commissioned to execute subtask 4, Development of Hydrogen Prod'n. Technologies in WE-NET project of NEDO-MITI, the authors were developing technologies for high performance solid polymer electrolyte electrolyzers. In terms of tech. features, the authors' technol. approach calls for membrane-electrode assemblies to be formed by a hot-press method. In this development activities, diverse types of 50 cm² membrane-electrode assemblies were fabricated by composing of

various iridium oxide powders as anode catalysts and various ion-exchange membranes. Consequently, the authors have obtained a electrolyzer with a membrane-electrode assembly composed of high surface area iridium dioxide (46 m²/g) as anode catalysts and a thin ion-exchange membrane (52 mm) which registered 1.59 V of cell voltage at a c.d. of 1 A/cm² at 80°.

Keywords

solid polymer electrolyte water electrolyzer
 iridium oxide anode water electrolysis
 ion exchange membrane electrolyzer water electrolysis

Index Entries

Membrane cells

high performance solid polymer electrolyte water electrolyzer
 Ion exchange membranes
 in high performance solid polymer electrolyte water electrolyzer
 Electrochemical oxidation catalysts
 iridium oxide for oxygen evolution in water electrolysis in solid polymer electrolyte electrolyzer
 Sulfonic acids, uses
 perfluorosulfonic acid polymers; in high performance solid polymer electrolyte water electrolyzer
 Electrochemical reduction catalysts
 platinum black for hydrogen evolution in water electrolysis in solid polymer electrolyte electrolyzer
 Fluoropolymers, uses
 sulfo-contg.; in high performance solid polymer electrolyte water electrolyzer
 12030-49-8
 anode catalyst in high performance solid polymer electrolyte water electrolyzer
 7440-06-4, uses
 cathode catalyst in high performance solid polymer electrolyte water electrolyzer
 7732-18-5, properties
 high performance solid polymer electrolyte in cell for electrolysis of
 7782-44-7, properties
 iridium oxide for oxygen evolution in water electrolysis in solid polymer electrolyte electrolyzer
 1333-74-0, properties
 platinum black for hydrogen evolution in water electrolysis in solid polymer electrolyte electrolyzer

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126:204553

Ultra-high tritium decontamination of simulated fusion fuel exhaust using a 2-stage palladium membrane reactor.

Birdsell, Stephen A.; Willms, R. Scott; Wilhelm, Richard C. (Los Alamos Natl. Lab., Los Alamos, NM 87545, USA). Fusion Technol., 30(3, Pt. 2A), 905-910 (English) 1996 American Nuclear Society
 CODEN: FUSTE8. ISSN: 0748-1896. DOCUMENT TYPE: Journal
 CA Section: 71 (Nuclear Technology)

A 2-stage cold (non-tritium) PMR system was tested with the ITER mix in 61 days of continuous operation. No decrease in performance was obsd. over the duration of the test. Decontamination factor (DF) was found to increase with decreasing inlet rate. Decontamination factors in excess of 1.4'10⁵ were obtained, but the exact value of the highest DF could not be detd. because of anal. limitations. Results of the 61-day test were used to design a 2-stage PMR system for use in tritium testing. The PMR system was scaled up by a factor of 6 and built into a glove box in the Tritium Systems Test Assembly (TSTA) of

the Los Alamos National lab. This system is approx. 1/5th of the expected full ITER scale. The ITER mix was injected into the PMR system for 31 h, during which 4.5 g of tritium were processed. The 1st stage had DF = 200 and the 2nd stage had DF = 2.9 '106. The overall DF= 5.8'108, which is greater than ITER requirements.

Keywords

palladium membrane reactor tritiated impurity decontamination
 tritium decontamination ITER fuel exhaust
 fusion plasma tritium decontamination
 tokamak plasma fuel exhaust tritium decontamination

Index Entries

Catalytic reactors
 Tokamak plasmas
 Tokamak reactors
 ultra-high tritium decontamination of simulated ITER fuel exhaust
 using 2-stage Pd membrane reactor
 74-82-8, properties
 7440-37-1, properties
 7732-18-5, properties
 two-stage Pd/Ag membrane reactor for ultra-high tritium
 decontamination of simulated ITER fuel exhaust composed
 of CH₄/H₂O/Ar mixt.
 7440-05-3, uses
 10028-17-8, properties
 ultra-high tritium decontamination of simulated ITER fuel exhaust
 using 2-stage Pd/Ag membrane reactor
 187887-98-5
 187888-02-4
 187888-03-5
 ultra-high tritium decontamination of simulated ITER fuel exhaust
 using 2-stage Pd/Ag membrane reactor with Ni/Al₂O₃ and
 Pt/Al₂O₃ catalysts
 7440-02-0, uses
 ultra-high tritium decontamination of simulated ITER fuel exhaust
 using 2-stage Pd/Ag membrane reactor with Ni/Al₂O₃
 catalyst
 7440-06-4, uses
 ultra-high tritium decontamination of simulated ITER fuel exhaust
 using 2-stage Pd/Ag membrane reactor with Pt/Al₂O₃
 catalyst
 7440-22-4, uses
 ultra-high tritium decontamination of simulated nuclear fusion fuel
 exhaust using 2-stage Pd/Ag membrane reactor
 1344-28-1, uses
 a- and g-Al₂O₃; ultra-high tritium decontamination of simulated ITER
 fuel exhaust using 2-stage Pd/Ag membrane reactor with
 Ni/Al₂O₃ and Pt/Al₂O₃ catalysts

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126:204144

Catalytic growth of single-wall carbon nanotubes: an ab initio study.
 Lee, Young Hee; Kim, Seong Gon; Tomanek, David (Dep. Phys.
 Astron., Michigan State Univ., East Lansing, MI 48824-1116, USA).
 Phys. Rev. Lett., 78(12), 2393-2396 (English) 1997 American Physical
 Society CODEN: PRLTAO. ISSN: 0031-9007. DOCUMENT TYPE:
 Journal CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic
 Reaction Mechanisms) Section cross-reference(s): 65
 We propose a catalytic growth mechanism of single-wall carbon
 nanotubes based on d. functional total energy calcns. Our results
 indicate nanotubes with an "armchair" edge to be energetically favored

over "zigzag" nanotubes. We also suggest that highly mobile Ni catalyst atoms adsorb at the growing edge of the nanotube, where they catalyze the continuing assembly of hexagons from carbon feedstock diffusing along the nanotube wall. In a concerted exchange mechanism, Ni atoms anneal carbon pentagons that would initiate a dome closure of the nanotube.

Keywords

catalytic growth single wall carbon nanotube
ab initio catalytic growth carbon nanotube
nickel catalyst growth carbon nanotube
mechanism catalytic growth carbon nanotube

Index Entries

Catalysts

Density-functional theory

Nanotubes

Reaction mechanism

catalytic growth of single-wall carbon nanotubes and ab initio study

7440-02-0, uses

7440-44-0, properties

catalytic growth of single-wall carbon nanotubes and ab initio study

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127:360770

Physicochemical characterization and catalytic activity of primary amine templated aluminosilicate mesoporous catalysts.

Mokaya, Robert; Jones, William (Department of Chemistry, University of Cambridge, Cambridge CB2 1EW, UK). J. Catal., 172(1), 211-221 (English) 1997 Academic Press CODEN: JCTLA5. ISSN: 0021-9517.

DOCUMENT TYPE: Journal CA Section: 51 (Fossil Fuels, Derivatives, and Related Products) Section cross-reference(s): 67, 78

Primary amines are used as structure-directing agents in the room temp. assembly of aluminosilicate inorg. species to yield mesoporous materials with phys. and textural properties similar to those of MCM-41 but with substantially higher Bronsted acidity. Si and Al are incorporated into the mesoporous framework in proportions dependent on the gel Si/Al ratio. Calcination of the as-synthesized material to remove the occluded amine generates Bronsted acid sites which (depending on Si/Al ratio) are stronger or comparable in strength to those on zeolite-HY (Si/Al = 3.65) but weaker than those on ultrastable-Y zeolite (USY). The materials, designated Al-MMS, exhibit higher Bronsted acidity and catalytic activity for the cracking of cumene compared to equiv. aluminosilicate MCM-41 materials or to amorphous silica-alumina and show considerable stability to catalytic deactivation. Al-MMS samples with Si/Al ratio ≤ 20 have catalytic activity higher than the zeolite-HY but exhibit a lower rate of deactivation compared to the zeolite. Ageing of the materials (for 1 yr in the calcined form) has no significant effect on their acidity and catalytic activity. Hexagonal ordering and total Bronsted acidity (but not acid strength) of the Al-MMS materials may be improved by using prepolymerized aluminosilicate inorg. precursors.

Keywords

aluminosilicate amine templated acidity cracking catalyst

Index Entries

Zeolites (synthetic), uses

Al-MMS; physicochem. characterization and catalytic activity of primary amine templated aluminosilicate mesoporous

catalysts

Primary amines

C8-16; physicochem. characterization and catalytic activity of

primary amine templated aluminosilicate mesoporous

catalysts

Bronsted acidity

Cracking catalysts

Lewis acidity

Petroleum refining catalysts

Silicalites (zeolites)

physicochem. characterization and catalytic activity of primary

amine templated aluminosilicate mesoporous catalysts

98-82-8

cracking of; physicochem. characterization and catalytic activity of

primary amine templated aluminosilicate mesoporous

catalysts

7631-86-9, uses

physicochem. characterization and catalytic activity of primary

amine templated aluminosilicate mesoporous catalysts

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127:358728

One-pot Chemoenzymic Synthesis of 3'-Functionalized

Cephalosporines (Cefazolin) by Three Consecutive

Biotransformations in Fully Aqueous Medium..

Justiz, O. H.; Fernandez-Lafuente, R.; Guisan, J. M.; Negri, P.; Pagani,

G.; Pregnotato, M.; Terreni, M. (Laboratorio de Tecnologia Enzimatica

Instituto de Catalisis, C.S.I.C. Universidad Autonoma, Madrid 28049,

Spain). J. Org. Chem., 62(26), 9099-9106 (English) 1997 American

Chemical Society CODEN: JOCEAH. ISSN: 0022-3263.

DOCUMENT TYPE: Journal CA Section: 26 (Biomolecules and Their

Synthetic Analogs) Section cross-reference(s): 7

The authors illustrate a new chemoenzymic synthesis of cefazolin from cephalosporin C, involving three consecutive biotransformations in full aq. medium. This one pot three step synthesis includes the D-amino acid oxidase catalyzed oxidative deamination of the cephalosporin C side chain, hydrolysis of the resulting glutaryl deriv. catalyzed by glutaryl acylase, and the final penicillin G acylase (PGA) catalyzed acylation of 7-aminocephalosporanic acid (7-ACA). The product, 7-[(1H-tetrazol-1-yl)-acetamido]-3-acetoxymethyl-D3-cephem-4-carboxylic acid, was used as an intermediate for cefazolin synthesis by 3'-acetoxy group displacement with 2-mercapto-5-methyl-1,3,4-thiadiazole. Very high yields have been achieved with all the enzymic reactions performed; high product concns. were obtained in short reaction times. This synthetic approach presents several advantages when compared with the conventional chem. processes. The use of the toxic reagents and chlorinated solvents is avoided, while the substrate specificity and chemoselectivity of the enzymes makes reactive group protection and intermediate purifn. unnecessary. The enzymic deacylation of cephalosporin C was performed by the simultaneous use of D-amino acid oxidase and glutaryl acylase. The substrate specificity of PGA allowed the acylation of 7-ACA to be performed without purifn. from the glutaric acid produced during the enzymic deacylation. These results were achieved by optimization and correct assembly of the different biotransformations involved. Special attention has been applied to the kinetically controlled acylation reaction. High yield were obtained through a careful selection of the enzyme catalyst, exptl. conditions, and synthetic strategy.

Keywords

cephalosporin synthesis deamination hydrolysis acylation enzymic

Index Entries

Acylation (biological)
 Deacylation (biological)
 enzymic; one-pot chemoenzymic synthesis of 3'-functionalized
 cephalosporines (Cefazolin) by three consecutive
 biotransformations in fully aq. medium
 Deamination
 oxidative, enzymic; one-pot chemoenzymic synthesis of
 3'-functionalized cephalosporines (Cefazolin) by three
 consecutive biotransformations in fully aq. medium
 25953-19-9
 32510-61-5
 957-68-6
 21732-17-2
 9000-88-8
 9014-06-6
 9016-18-6
 61-24-5
 29490-19-5
 30246-33-4
 55633-19-7
 one-pot chemoenzymic synthesis of 3'-functionalized
 cephalosporines (Cefazolin) by three consecutive
 biotransformations in fully aq. medium

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127:333937

Polymer electrolyte fuel cells.
 Gottesfeld, Shimshon; Zawodzinski, Tom A. (Mater. Sci. Technol. Div.,
 Electronic Electrochemical Mater. Devices Group, Los Alamos Natl.
 Lab., Los Alamos, NM 87545, USA). Adv. Electrochem. Sci. Eng., 5,
 195-301 (English) 1997 Wiley-VCH CODEN: AESEY. ISSN:
 0938-5193. DOCUMENT TYPE: Journal; General Review CA Section:
 52 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 38, 76
 A review with 120 refs. on single polymer electrolyte fuel cells, fuel cell
 stacks, and complete power systems. Research and development
 efforts are described at the fuel cell level that enhanced the
 understanding of PEFC performance, cost and reliability. Topics
 include a general description of the polymer electrolyte fuel cell,
 electrocatalysis in the PEFC, the membrane/electrode assembly for
 electrocatalysis, the ionomeric membrane, modeling and diagnostics
 of the PEFC, PEFC stack and complete power systems, and the
 polymer electrolyte direct methanol fuel cell (DMFC).

Keywords

review polymer electrolyte fuel cell

Index Entries

Fuel cells
 PEFC; polymer electrolyte fuel cells, stacks, and power systems
 Catalysis
 electrochem.; polymer electrolyte fuel cells, stacks, and power
 systems
 Membranes (nonbiological)
 ionomers; polymer electrolyte fuel cells, stacks, and power systems
 Ionomers
 membranes; polymer electrolyte fuel cells, stacks, and power
 systems
 Fuel cell anodes
 Fuel cell electrolytes

Gas diffusion electrodes
 Physicochemical simulation
 Reduction
 Reduction kinetics
 polymer electrolyte fuel cells, stacks, and power systems
 124-38-9, processes
 630-08-0, processes
 catalyst poisoning; polymer electrolyte fuel cells, stacks, and
 power systems
 7440-06-4, uses
 7440-44-0, uses
 1333-74-0, reactions
 7782-44-7, reactions
 polymer electrolyte fuel cells, stacks, and power systems

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127:279273

Prevention of bubble formation during curing of RTV silicone seals and
 sealants by addition of oximosilicon compounds.

Carbary, Lawrence Donald; Freiberg, Alan Lee; Klosowski, Jerome
 Melvin; Lower, Loren Dale (Dow Corning Corp., USA). Eur. Pat. Appl.

EP 798338 A2 1 Oct 1997, 12 pp. DESIGNATED STATES: R: BE,
 DE, FR, GB, IT. (European Patent Organization). CODEN: EPXXDW.

CLASS: ICM: C08K005-54. ICS: C08L083-04. APPLICATION: EP
 97-301780 17 Mar 1997. PRIORITY: US 96-622074 26 Mar 1996.

DOCUMENT TYPE: Patent CA Section: 38 (Plastics Fabrication and
 Uses)

A seal which is essentially free of bubbles and useful in internal
 combustion engines, comprises an alkoxy-terminated
 polydiorganosiloxane, a crosslinker having ³ silicon-bonded methoxy
 or ethoxy groups/mol, a filler, a titanate catalyst, and an oximosilicon
 compd RxSi(OX)y(OR1)z (R = Me, Et, vinyl, Ph; R1 = Me, Et; OX = Cl-5
 alkylmethylketoximo; x, z = 0-2 av.; y = 2-4 av; x = y = z = 4). The
 compn. is applied to ² nonporous substrates to form an assembly,
 and cured to bond the substrates together without bubbles under typical
 condition. Thus, a mixt. of a polydimethylsiloxane with vinyl and
 trimethoxysilyl end-groups and a polydimethylsiloxane with
 trimethoxysilyl end-groups 100, a crosslinking agent mixt. (contg. mainly
 methyltrimethoxysilane, 3-mercaptopropyltrimethoxysilane,
 N-b-aminoethyl-g-aminopropyltrimethoxysilane, and titanate catalysts)
 11.1, fumed silica filler 9.4 and pptd. calcium carbonate 60.3 parts
 were mixed under vacuum from the RTV sealant (methanol content
 0.239%), to which methyltri(ethylmethylketoximo)silane was added
 0.5%, showing surface bubble both value and internal void value 0, vs.
 1 and 4, resp., for a sample without oximosilicon.

Keywords

oximosilicon modified silicone sealant bubble elimination
 methyltriethylmethylketoximosilane modified silicone sealant bubble
 elimination
 polydimethylsiloxane sealant oximosilicon modified bubble elimination
 ketoximosilane modified silicone sealant bubble elimination

Index Entries

Gaskets
 Internal combustion engines
 Polysiloxanes, uses
 prevention of bubble formation during curing of RTV silicone seals
 and sealants by addn. of oximosilicon compds.
 1185-55-3
 1760-24-3
 4420-74-0

crosslinking agent; prevention of bubble formation during curing of RTV silicone seals and sealants by addn. of oximosilicon compds.

2224-33-1

22984-54-9

93917-75-0

101371-00-0

101371-01-1

9016-00-6

31900-57-9

prevention of bubble formation during curing of RTV silicone seals and sealants by addn. of oximosilicon compds.

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127:268435

Relation between Crystallite Size and Dispersion on Supported Metal Catalysts.

Borodzinski, Andrzej; Bonarowska, Magdalena (Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw 01-224, Pol.).

Langmuir, 13(21), 5613-5620 (English) 1997 American Chemical

Society CODEN: LANGD5. ISSN: 0743-7463. DOCUMENT TYPE:

Journal CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms) Section cross-reference(s): 66

Universal math. relations between the mean relative size of metallic crystallites ($d_{rel}(VS)$) and their dispersion (FE) in supported metal catalysts have been developed. The relations are: $d_{rel}(VS) = 5.01/FE$ for $FE < 0.2$, and $d_{rel}(VS) = 3.32/FE^{1.23}$ for $0.2 \leq FE \leq 0.92$, where $d_{rel}(VS) = d_{V/S}/d_{at}$, ($d_{V/S}$) is the vol.-surface mean diam. of an assembly of particles of different sizes, and d_{at} is the at. diam. of a given metal. It is shown that for $FE > 0.2$ the commonly used definition of $d_{V/S}$ should be modified. The developed relations apply well to various thermodynamically probable crystallite shapes including fcc cubooctahedra of varying geometry, icosahedra, surface-reconstructed cubooctahedra, bcc rhombic dodecahedra, and hcp truncated bipyramids. The new relations are more precise than the commonly used equation $d_{V/S} = a/FE$, where a is a const. specific to a given metal.

Keywords

crystallite size dispersion supported metal catalyst

Index Entries

Catalysts

Crystallites

Dispersion (of materials)

Metals, uses

relation between crystallite size and dispersion on supported metal catalysts

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127:248371

Steric control for the hydrolysis of enantiomeric and diastereomeric esters. A new development of supramolecular assemblies.

Goto, Kouichi; Ueoka, Ryuichi (Grad. Course Appl. Chem., Kumamoto Inst. Technol., Kumamoto 860, Japan). Yuki Gosei Kagaku Kyokai, 55(9), 803-813 (Japanese) 1997 Yuki Gosei Kagaku Kyokai CODEN: YGKKAE. ISSN: 0037-9980. DOCUMENT TYPE: Journal; General

Review CA Section: 34 (Amino Acids, Peptides, and Proteins) Section cross-reference(s): 7, 33

A review with 49 refs. The remarkably high enantioselectivity ($k_{La,obsd}/k_{Da,obsd} = 1000$) was attained for the hydrolysis of amino acid esters [N-dodecanoyl-D(L)-phenylalanine p-nitrophenyl ester;

C12-D(L)-Phe-PNP] catalyzed by the active tripeptide [N-(benzyloxycarbonyl)-L-phenylalanyl-L-histidyl-L-leucine; Z-Phe-His-Leu] in the coaggregate systems composed of 41 mol% hexadecyltrimethylammonium bromide (CTAB) and 59 mol% ditetradecyldimethylammonium bromide (2C14Br) at the specific ionic strength ($m = 0.02$). With respect to the temp. dependence of hydrolysis in the coaggregate systems composed of native lipid (L- α -dipalmitoylphosphatidylcholine; DPPC) and nonionic surfactant [α -[4-(1,1,3,3-tetramethylbutyl)phenyl]- ω -hydroxydecakis(oxyethylene); Triton X-100], the enantioselectivity was maximized at the phase transition temp. (Te) and the hydrophobic microenvironment of coaggregates could be evaluated on the basis of isokinetic temp. (b). On the other hand, in the stereoselective hydrolysis of dipeptide esters as mediated by cyclodextrins (CyD), a high diastereoselectivity ($k_{DL2}/k_{LL2} = 46$) and preferential binding property ($K_{DLb}/K_{LLb} = 2.4$) were obsd. for the hydrolysis of N-(benzyloxycarbonyl)-D(L)-phenylalanyl-L-phenylalanine p-nitrophenyl ester (Z-D(L)-Phe-L-Phe-PNP) by g-CyD. Furthermore, the computer modeling (MOPAC calcn.) study suggests that a favorable mol. recognition between the substrate and catalyst through the effective hydrophobic interactions and hydrogen bonds should be very important for the enhancement of stereoselectivity.

Keywords

review stereocontrol amino acid ester hydrolysis
artificial enzyme ester stereoselective hydrolysis review
peptide ester diastereoselective hydrolysis cyclodextrin review
supramol assembly ester enantioselective hydrolysis review
mol recognition cyclodextrin dipeptide ester review

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Molecular recognition
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Stereoselective hydrolysis
Stereoselective hydrolysis catalysts
Tripeptides
development of supramol. assemblies in steric control for
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Amino acids, reactions
Dipeptides
esters; development of supramol. assemblies in steric control for
hydrolysis of enantiomeric and diastereomeric esters
Enzymes, uses
synthetic; development of supramol. assemblies in steric control for
hydrolysis of enantiomeric and diastereomeric esters
12619-70-4
development of supramol. assemblies in steric control for
hydrolysis of enantiomeric and diastereomeric esters

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127:244536

Three-dimensional metalization of microtubules.
Kirsch, R.; Mertig, M.; Pompe, W.; Wahl, R.; Sadowski, G.; Boehm, K.
J.; Unger, E. (Max-Planck-Arbeitsgruppe Mechanik heterogener
Festkoerper, an der Technischen Universitaet Dresden, Hallwachsstr.
3, D-01069, Dresden, Germany). Thin Solid Films, 305(1,2), 248-253
(English) 1997 Elsevier CODEN: THSFAP. ISSN: 0040-6090.
DOCUMENT TYPE: Journal CA Section: 6 (General Biochemistry)
Section cross-reference(s): 56
Microtubules (MTs), components of the cytoskeletons of eukaryotic
cells, are protein filaments with outer diams. of 25 nm and lengths of
several micrometers. Due to their large geometrical aspect ratios, they

are well suited for use as biomol. templates for the fabrication of magnetic and elec. conductive nanowires. Three-dimensional metalization of these MTs is demonstrated by an electroless deposition technique of nickel initiated by mol. palladium catalysts. In this study of the deposition conditions, it is shown that in the use of electroless plating for the metalization of tubulin assemblies the process parameters, such as temp. and pH, need to be adjusted to the chem. conditions of the in-vitro self-assembly process of MTs. The activated and metalized MTs have been characterized by SEM and TEM. Depending on the distribution of the Pd catalyst particles after MT activation, we found that a min. nickel thickness of about 10 nm is required to produce a continuous film.

Keywords

microtubule metalization nanowire nickel palladium

Index Entries

Metalization (process)
Microtubule
metalization of microtubules
Wire
nanowire; metalization of microtubules
Nanostructures
nanowires; metalization of microtubules
7440-02-0, biological studies
7440-05-3, uses
metalization of microtubules

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127:221027

Controlling the radical polymerization of monodendritic monomers via self-organization.

Percec, V.; Ahn, C. -H.; Barboiu, B. (The W. M. Keck Laboratories for Organic Synthesis, Department of Macromolecular Science, Case Western Reserve University, Cleveland, OH 44106-7202, USA).

Polym. Mater. Sci. Eng., 77, 107-108 (English) 1997 American Chemical Society CODEN: PMSEGD. ISSN: 0743-0515.

DOCUMENT TYPE: Journal CA Section: 35 (Chemistry of Synthetic High Polymers)

The study of the free radical polymn. of styrene and methacrylate with very bulky dendritic side groups able to self-assemble into columnar or spherical supramol. assemblies shows evidence for the interaction between the self-assembly and reaction mechanism. This polymn. mechanism takes place in an optically isotropic phase and this implies that the spheres/columns do not have a preferential orientation. At low monomer concn. in soln. the rate of polymn. decreases and the polymers have low mol. wt. and narrow mol. wt. distribution (MWD). The narrow MWD is a result of the above mentioned steric hindrance of the growing chain which prevents termination by the combination of two rigid growing columns.

Keywords

methacrylate dendritic radical polymn kinetics mechanism
styrene dendritic radical polymn kinetics mechanism

Index Entries

Radical polymerization catalysts
for controlling radical polymn. of monodendritic monomers via self-organization
Radical polymerization

Radical polymerization kinetics
 kinetics and mechanism of controlled radical polymn. of
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 94-36-0, uses
 110-05-4
 catalyst; controlling radical polymn. of monodendritic monomers
 via self-organization
 195062-58-9
 195062-60-3
 controlling radical polymn. of monodendritic monomers via
 self-organization
 195062-55-6
 195062-56-7
 kinetics and mechanism of controlled radical polymn. of
 monodendritic monomers via self-organization

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127:178643
 Proton exchange membrane fuel cells. Progress in cost reduction of the
 key components.
 Ralph, T. R. (Johnson Matthey Technology Centre, UK). Platinum Met.
 Rev., 41(3), 102-113 (English) 1997 Johnson Matthey Public Ltd. Co.
 CODEN: PTMRA3. ISSN: 0032-1400. DOCUMENT TYPE: Journal;
 General Review CA Section: 52 (Electrochemical, Radiational, and
 Thermal Energy Technology)
 A review with 34 refs. This report details the progress made on redns.
 in the stack cost by lowered platinum catalyst loadings in the latest
 stack designs, the development of lower cost membrane electrolytes,
 the design of alternative bipolar flow field plates, and the introduction of
 mass prodn. technol. Despite such advances, there is still a need for
 further redns. in the stack cost, through improvements in the
 performance of the membrane electrode assembly. However,
 improved stack performance must be demonstrated not only with pure
 hydrogen fuel but also, more particularly, with reformat fuel, where
 tolerance to poisoning by carbon monoxide and carbon dioxide needs
 to be improved. Advances that are required in the ancillary
 sub-systems are also briefly considered here.

Keywords

review proton exchange membrane fuel cell
 fuel cell component cost redn review

Index Entries

Fuel cells
 proton exchange membrane; progress in cost redn. of key
 components of proton exchange membrane fuel cells

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127:136769
 Curable organopolysiloxane composition and its use as adhesive.
 Nakanishi, Junji; Yoshitake, Makoto (Dow Corning Toray Silicone Co.,
 Ltd., Japan). Eur. Pat. Appl. EP 781814 A2 2 Jul 1997, 10 pp.
 DESIGNATED STATES: R: DE, FR, GB. (European Patent
 Organization). CODEN: EPXXDW. CLASS: ICM: C08L083-08.
 APPLICATION: EP 96-309465 23 Dec 1996. PRIORITY: JP
 95-352804 28 Dec 1995. DOCUMENT TYPE: Patent CA Section: 38
 (Plastics Fabrication and Uses)
 The compn. remains fluid when kept under seal in the dark, rapidly
 forms a nonfluid tacky mass when exposed to high-energy radiation,
 such as UV or electron beam radiation, and subsequently continues to

cure through an atm. moisture-mediated reaction to yield an elastic material. The curable compn., with viscosity at 25° f3000 Pa-s, comprises the product obtained by mixing an alkenyl-functional silicone resin, a polysiloxane that contains siloxy units functionalized with both mercapto and Si-bonded alkoxy and does not contain alkenyl, and a condensation catalyst. The compn. is used for bonding a substrate and an adherend by coating the substrate with the compn., irradiating the coated substrate with high-energy radiation, bringing the adherend into contact with the irradiated surface, and thereafter maintaining the assembly in a moisture-contg. atm. A suitable compn. with viscosity 160 Pa-s, which produced a bond between glass sheets with shear adhesive strength 235.4 kPa/2.5 cm² after 5 min and 539.4 kPa/2.5 cm² after 24 h, was obtained by heating a mixt. of 71.4 g 70% xylene soln. of trimethylsilyl dimethylvinylsilyl silicate of empirical formula (Me₃SiO_{0.5})₃₆(CH₂:CHSiMe₂O_{0.5})₅(SiO₂)₅₉ and 50.0 g HS(CH₂)₃Si(OMe)₂(OSiMe₂)₃₃OSi(OMe)₂(CH₂)₃SH under reduced pressure to evap. the xylene, cooling, and adding PhC(OMe)₂COPh 0.5, Ti(Obu)₄ 1.0, and MeSi(OMe)₃ 2.0 g.

Keywords

silicone adhesive UV moisture curable

Index Entries

Adhesives

Polysiloxanes, uses

UV- and moisture-curable siloxane compn. for use as adhesive

5593-70-4

6175-45-7

24650-42-8

27858-32-8

1185-55-3

31900-57-9, (3-mercaptopropyl)dimethoxysilyl-terminated

107712-53-8

191604-02-1

UV- and moisture-curable siloxane compn. for use as adhesive

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127:82578

Preapplied, curable silicone threadlocking adhesive and sealant.

Rich, Richard D.; Maandi, Eerik; Gontarz, Paula M.; Chu, Hsien-kun (Loctite Corp., USA). U.S. US 5635546 A 3 Jun 1997, 10 pp. (United States of America). CODEN: USXXAM. CLASS: ICM: C09J004-02.

ICS: C08L083-07. NCL: 523176000. APPLICATION: US 96-603845

22 Feb 1996. DOCUMENT TYPE: Patent CA Section: 38 (Plastics Fabrication and Uses)

A title compn., useful for threadlocking engageable members of a threaded mech. fastener, e.g., bolt/nut assembly, comprise a reactive silicone (meth)acrylate emulsified in an aq. medium, optionally a polymerizable non-silicone (meth)acrylate monomer or oligomer, and a microencapsulated peroxy initiator for cure of the reactive silicone (meth)acrylate. The emulsion may be applied to at least a portion of an engagement surface of a matable part, dried to form a coating, and the surface engaged with the complementary engagement structure, to release the microencapsulated peroxy initiator and bond the matable part and complementary engagement structure. A typical compn. contained ethoxylated bisphenol A dimethacrylate, Acrysol ASE-60, Me₃Si-capped

dimethyldimethoxysilane-methacryloxypropyltrimethoxysilane-phenyltrimethoxysilane copolymer (prepn. given), n-Bu ferrocene, PhCO₂NH₄, NH₄OH, and microencapsulated benzoyl peroxide in H₂O.

Keywords

methacrylate polysiloxane curable threadlocking adhesive emulsion
methacryloxypropyltrimethoxysilane polysiloxane curable threadlocking
sealant
ethoxylated bisphenol dimethacrylate polysiloxane curable sealant
benzoyl peroxide microencapsulated catalyst polysiloxane sealant

Index Entries

Polysiloxanes, uses

acrylic-epoxy, aq. emulsions; preapplied, curable silicone
threadlocking adhesive and sealant contg. ethoxylated
bisphenol A dimethacrylate and anionic acrylic polymer and
microencapsulated peroxy catalysts and

Epoxy resins, uses

acrylic-polysiloxane-, aq. emulsions; preapplied, curable silicone
threadlocking adhesive and sealant contg. ethoxylated
bisphenol A dimethacrylate and anionic acrylic polymer and
microencapsulated peroxy catalysts and

Peroxides, uses

crosslinking catalysts; preapplied, curable silicone threadlocking
adhesive and sealant contg. methacrylate polysiloxanes
and ethoxylated bisphenol A dimethacrylate and anionic
acrylic polymer and microencapsulated

Adhesives

Sealing compositions

curable, aq. emulsions; preapplied, curable silicone threadlocking
adhesive and sealant contg. methacrylate polysiloxanes
and ethoxylated bisphenol A dimethacrylate and anionic
acrylic polymer and microencapsulated peroxy catalysts

Polysiloxanes, uses

methacrylate-, aq. emulsions; preapplied, curable silicone
threadlocking adhesive and sealant contg. ethoxylated
bisphenol A dimethacrylate and anionic acrylic polymer and
microencapsulated peroxy catalysts and

Crosslinking catalysts

microencapsulated peroxides; preapplied, curable silicone
threadlocking adhesive and sealant contg. methacrylate
polysiloxanes and ethoxylated bisphenol A dimethacrylate
and anionic acrylic polymer and

Bolts

preapplied, curable silicone threadlocking adhesive and sealant
contg. methacrylate polysiloxanes and ethoxylated
bisphenol A dimethacrylate and anionic acrylic polymer and
microencapsulated peroxy catalysts

191721-26-3

191721-27-4

191721-28-5

aq. emulsion; preapplied, curable silicone threadlocking adhesive
and sealant contg. anionic acrylic polymer and
microencapsulated peroxide and

37325-11-4

aq. emulsion; preapplied, curable silicone threadlocking adhesive
and sealant contg. methacrylate polysiloxanes and
ethoxylated bisphenol A dimethacrylate and

94-36-0, uses

preapplied, curable silicone threadlocking adhesive and sealant
aq. emulsions contg. methacrylate polysiloxanes and
ethoxylated bisphenol A dimethacrylate and anionic acrylic
polymer and microencapsulated

1336-21-6

1863-63-4

31904-29-7

preapplied, curable silicone threadlocking adhesive and sealant
aq. emulsions contg. methacrylate polysiloxanes and

ethoxylated bisphenol A dimethacrylate and anionic acrylic polymer and microencapsulated peroxy catalysts and 7732-18-5, uses preapplied, curable silicone threadlocking adhesive and sealant emulsions contg. methacrylate polysiloxanes and ethoxylated bisphenol A dimethacrylate and anionic acrylic polymer and microencapsulated peroxy catalysts

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127:68582

Processed sulfonic acid polymer for proton-conducting electrolytic membranes for fuel cells.

Yen, Shaio-ping S.; Narayanan, Sekharipuram R.; Halpert, Gerald; Graham, Eva; Yavrouian, Andre (California Institute of Technology; Yen, Shaio-Ping S.; Narayanan, Sekharipuram R.; Halpert, Gerald; Graham, Eva; Yavrouian, Andre, USA). PCT Int. Appl. WO 9719480 A1 29 May 1997, 45 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: H01M008-10. ICS: H01M008-22; C08J005-18.

APPLICATION: WO 96-US18823 22 Nov 1996. PRIORITY: US 95-561899 22 Nov 1995. DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 38

The processed polymer has asym. properties. The preferred fuel-cell assembly includes an anode which is a porous C electrode including C/catalyst particles coated with the processed sulfonic acid polymer. The anode current collector includes carbon paper fiber impregnated with the processed polymer. Proton-conducting membrane adjoins the cathode. The proton-conducting membrane includes a dense surface of proton-conducting membrane facing the anode. The surface facing the cathode is preferably a very thin layer of crosslinked low proton-conducting surface.

Keywords

sulfonic acid polymer fuel cell membrane
polymer sulfonic acid processed fuel cell

Index Entries

Polyketones

Polysulfones, uses

polyether-, arom., sulfonated; processed sulfonic acid polymer for proton-conducting electrolytic membranes for fuel cells

Polyethers, uses

polyketone-, arom., sulfonated; processed sulfonic acid polymer for proton-conducting electrolytic membranes for fuel cells

Polyethers, uses

polysulfone-, arom., sulfonated; processed sulfonic acid polymer for proton-conducting electrolytic membranes for fuel cells

Fuel cell electrolytes

processed sulfonic acid polymer for proton-conducting electrolytic membranes for

25667-42-9, sulfonated

31694-16-3, sulfonated

processed sulfonic acid polymer for proton-conducting electrolytic membranes for fuel cells

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127:36284

Non-wetting electrostatic assisted nozzle for spraying a catalytic melt.
Hu, D.; Balachandran, W. (Dep. Electronic Electrical Eng., Univ. Surrey,
Guildford GU 5XH, UK). Part. Sci. Technol., 15(1), 1-12 (English) 1997
Taylor & Francis CODEN: PTCHDS. ISSN: 0272-6351. DOCUMENT
TYPE: Journal CA Section: 47 (Apparatus and Plant Equipment)

Section cross-reference(s): 67

In this paper the authors present how a normal pressure nozzle can be adapted into a successful electrostatic assisted atomizer for one particular industrial application. The "Reverse Modeling" technique for the design of the nozzle head, induction electrode and counter 'wetting' electrode using finite element method is of universal value and can be used widely in induction electrostatic spraying applications where wetting is a problem. Exptl. results showed that under the same operating condition, an optimized geometry and position of electrodes can give a spray current an order of magnitude higher than the previous design without any wetting problem. An optimum combination of an induction and a counter electrode geometry and positions will ensure a non-wetting induction nozzle assembly with very high charging efficiency.

Keywords

catalyst melt atomization nonwetting spray nozzle

Index Entries

Atomizing (spraying)

electrostatic; non-wetting electrostatic assisted nozzle for spraying catalytic melts

Electrodes

induction-ring and counter; non-wetting electrostatic assisted nozzle for spraying catalytic melts

Catalysts

molten; non-wetting electrostatic assisted nozzle for spraying catalytic melts

Crystallization

Finite element simulation

Nozzles

Wetting

non-wetting electrostatic assisted nozzle for spraying catalytic melts

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127:14097

Mutations of the coat protein gene of bacteriophage 1 that overcome the necessity for the FI gene; the EFi domain.

Murialdo, Helios; Tzamtzis, Dimitra (Department of Medical Genetics and Microbiology, University of Toronto, Toronto, ON M5S-1A8, Can.).

Mol. Microbiol., 24(2), 341-353 (English) 1997 Blackwell CODEN:

MOMIEE. ISSN: 0950-382X. DOCUMENT TYPE: Journal CA

Section: 3 (Biochemical Genetics) Section cross-reference(s): 10

The functions of most of the 10 genes involved in phage 1 capsid morphogenesis are well understood. The function of the FI gene is one of the exceptions. Mutants in FI fail to mature and package DNA. The gene product (gpFI) seems to act as a catalyst for the formation of an intermediate in capsid assembly called complex II, which contains a procapsid (an empty capsid precursor), terminase (the enzyme that cleaves the DNA precursor and packages it into the procapsid) and DNA. The mechanism for this stimulation remains unknown. It has also been reported that gpFI appeared to stimulate terminase-mediated cos cleavage, in the absence of procapsids, by increasing enzyme turnover. In comparison with other head-gene mutants, FI mutants are

leaky, producing approx. 0.1 phage per infected cell. Some second-site revertants of FI- phages, called "fin", that bypass the necessity for gpFI, have been isolated and found to harbor a mutation in the genes that code for the two subunits of terminase. In the course of mapping addnl. fin mutants, it was discovered that some mapped outside the terminase genes. To localize the mutations, restriction fragments of fin mutant DNAs were subcloned into plasmids and their ability to contribute to fin function was detd. by marker-rescue anal. The location of the fin mutations was further delineated by deletion anal. of a plasmid that was pos. for fin. This showed that some fin mutations mapped to a region comprising genes E, D and a portion of C. The sequencing of this entire region in several fin isolates showed that the fin mutations are clustered in a small region of gene E corresponding to a portion of 26 amino acid residues of the coat protein (gpE). We have called this region of the protein the EFi domain. All the mutations result in an increase in pos. charge relative to the wild-type protein. These results suggest that DNA maturation and packaging are in part controlled by an interaction between gpFI and capsid gpE.

Keywords

Lambda coat protein gene mutation FI
mutation coat protein gene FI gene

Index Entries

Genes (microbial)

E, fin mutations are clustered in a small region of gene E; mutations of the coat protein gene of bacteriophage 1 that overcome the necessity for the FI gene; the EFi domain

Protein motifs

EFi domain, fin mutations are clustered in gene E region of 26 residues of coat protein (gpE); mutations of the coat protein gene of bacteriophage 1 that overcome the necessity for the FI gene; the EFi domain

Genes (microbial)

FI; mutations of the coat protein gene of bacteriophage 1 that overcome the necessity for the FI gene; the EFi domain

Electric charge

all mutations result in an increase in pos. charge; mutations of the coat protein gene of bacteriophage 1 that overcome the necessity for the FI gene; the EFi domain

Mutation

fin, second-site revertants of FI- phages, are called "fin"; mutations of the coat protein gene of bacteriophage 1 that overcome the necessity for the FI gene; the EFi domain

Genes (microbial)

Coat proteins

gpE; mutations of the coat protein gene of bacteriophage 1 that overcome the necessity for the FI gene; the EFi domain

Coliphage 1

mutations of the coat protein gene of bacteriophage 1 that overcome the necessity for the FI gene; the EFi domain

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127:6749

A method for producing copper sulfate monohydrate.

Benedikova, Eleonora; Medzo, Andrej (Benedikova, Eleonora; Medzo, Andrej, Slovakia). PCT Int. Appl. WO 9716379 A1 9 May 1997, 8 pp.

DESIGNATED STATES: US, W UZ, W VN, W AM, W AZ, W BY, W

KG, W KZ, W MD, W RU, W TJ, W TMES, FI, GB, GE, HU, IL, IS, JP,

KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW,

MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA,

UG, US, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE,

BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, NL, PT, SE. (World Intellectual Property Organization).

CODEN: PIXXD2. CLASS: ICM: C01G003-10. APPLICATION: WO

96-SK16 30 Oct 1996. PRIORITY: SK 95-1356 30 Oct 1995.

DOCUMENT TYPE: Patent CA Section: 49 (Industrial Inorganic Chemicals) Section cross-reference(s): 60

Small pieces of metallic copper waste are leached in a 10% sulfuric acid soln. while simultaneously hydrogen peroxide is added as a catalyst. Leaching is performed until the pH of the soln. is const. (5.0-5.5). The leaching effluent is settled, filtered through a mud-press, concd. by heating, evapg. and occasional pumping of the new soln. until a required concn. of copper of 150 g/L is reached. The input soln. is transferred to the dusting assembly which sprays the soln. at high revolution through jets onto the walls of drying chamber. The generated product is hammered by hammers from the walls and sucked with a blower through a cyclone into a reservoir. The input temp. of the drying chamber is maintained at 230° and output temp. at 110°.

Keywords

copper sulfate monohydrate manuf

Index Entries

Recycling

a method for producing copper sulfate monohydrate

Solid wastes

copper; a method for producing copper sulfate monohydrate

7722-84-1, uses

7664-93-9, reactions

a method for producing copper sulfate monohydrate

7440-50-8, reactions

waste; a method for producing copper sulfate monohydrate

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126:317728

Water-soluble ABC triblock copolymers based on vinyl ethers:

synthesis by living cationic polymerization and solution characterization.

Patrickios, Costas S.; Forder, Clive; Armes, Steven P.; Billingham, Norman C. (School Chemistry Molecular Sciences, University Sussex, Falmer, Brighton, E. Sussex BN1 9QJ, UK). J. Polym. Sci., Part A: Polym. Chem., 35(7), 1181-1195 (English) 1997 Wiley CODEN: JPACEC. ISSN: 0887-624X. DOCUMENT TYPE: Journal CA

Section: 35 (Chemistry of Synthetic High Polymers) Section cross-reference(s): 36

Water-sol. ABC triblock copolymers of Me vinyl ether (MVE), Et vinyl ether (EVE), and Me tri(ethylene glycol) vinyl ether (MTEGVE) of various block sequences and carrying 20 monomer units in each block, were synthesized by living cationic polymn. In addn. to the triblocks, one AB diblock, one BA diblock, and one statistical copolymer of MVE and MTEGVE carrying 20 units of each type of monomer were synthesized as controls. Three homopolymers, each carrying 20 units of MVE and end groups of varying hydrophobicity were synthesized using three different initiators. The mol. wt. and mol. wt. distribution of all the polymers were detd. by gel permeation chromatog. (GPC) in THF. The no. av. ds.p. (DPns) and compn. of all the polymers were calcd. by proton NMR spectroscopy. The mol. wts. and ds.p. corresponded to the values expected from the monomer/initiator ratios.

The calcd. polydispersities were reasonably narrow at 1.3. Aq. GPC studies at room temp. on the triblock copolymers indicate self assembly and formation of micelles in the presence of a sufficiently high salt concn., apparently due to the insoly. of the EVE units under the latter conditions. Triblocks with a different block sequence exhibited a

different susceptibility to salt-induced micellization, as indicated by the retention vol. of the micelles and the relative micelle/unimer peak areas.

Similarly, the cloud point of the triblock copolymers covered a relatively wide temp. range from 56 to 72°. These differences in micellization and cloud points suggest a profound effect of the location of the hydrophilic MTEGVE block on copolymer assocn.

Keywords

vinyl ether triblock copolymer prepn micellization
ethylene glycol vinyl ether hydrophobicity copolymer

Index Entries

Living polymerization
cationic; prepn. and micellization and cloud point of water-sol. vinyl ether triblock copolymers
Micelles
formation of; prepn. and micellization and cloud point of water-sol. vinyl ether triblock copolymers
Cationic polymerization
living; prepn. and micellization and cloud point of water-sol. vinyl ether triblock copolymers
Molecular weight
polydispersity; prepn. and micellization and cloud point of water-sol. vinyl ether triblock copolymers
Cloud point
Hydrophobicity
Polymerization catalysts
Reactivity ratio in polymerization
prepn. and micellization and cloud point of water-sol. vinyl ether triblock copolymers
183964-37-6
diblock; prepn. and micellization and cloud point of water-sol. vinyl ether triblock copolymers
19865-33-9
initiator; prepn. and micellization and cloud point of water-sol. vinyl ether triblock copolymers
1112-67-0
7646-78-8, uses
polymn. catalyst; prepn. and micellization and cloud point of water-sol. vinyl ether triblock copolymers
9003-09-2
25104-37-4
29695-84-9
prepn. and micellization and cloud point of water-sol. vinyl ether triblock copolymers
189354-11-8
triblock; prepn. and micellization and cloud point of water-sol. vinyl ether triblock copolymers

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126:280175

Oxygen and hydrogen permeation properties and water uptake of Nafion® 117 membrane and recast film for PEM fuel cell.

Broka, K.; Ekdunge, P. (Dep. Chemical Eng. Technology, Royal Inst.

Technology, Stockholm S-100 44, Swed.). J. Appl. Electrochem.,

27(2), 117-123 (English) 1997 Chapman & Hall CODEN: JAELEBJ.

ISSN: 0021-891X. DOCUMENT TYPE: Journal CA Section: 52

(Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 48

O2 and H2 permeability through Nafion 117 membrane and recast

Nafion film were studied by gas chromatog. at different values of temp.

and gas relative humidity. Water uptake from the vapor phase by

Nafion 117 membrane and recast film was also investigated. Water uptake decreased with increasing temp. and was slightly lower for the recast film. O₂ and H₂ permeability increased both with temp. and relative humidity of the gas, but water vapor uptake by both Nafion 117 membrane and recast film decreased with increasing temp. SEM studies performed on the membrane-electrode assembly obtained by impregnation/hot-pressing and on carbon/Nafion composite have indicated that the active catalyst layer is porous with channels for the gas transport. The results have application in the design and operation of PEM (proton-exchange membrane) fuel cells.

Keywords

oxygen hydrogen permeation membrane fuel cell
Nafion membrane hydrogen oxygen permeation

Index Entries

Protonation

membranes; oxygen and hydrogen permeation properties and water uptake of Nafion 117 membrane and recast film for design of PEM fuel cell

Permeability

Permeation

Relative humidity

oxygen and hydrogen permeation properties and water uptake of Nafion 117 membrane and recast film for design of PEM fuel cell

Fuel cells

proton-exchange membrane; oxygen and hydrogen permeation properties and water uptake of Nafion 117 membrane and recast film for design of PEM fuel cell

7440-06-4, uses

1333-74-0, uses

7782-44-7, uses

fuel cell; oxygen and hydrogen permeation properties and water uptake of Nafion 117 membrane and recast film for design of PEM fuel cell

66796-30-3

membrane; oxygen and hydrogen permeation properties and water uptake of Nafion 117 membrane and recast film for design of PEM fuel cell

7440-44-0, uses

support; oxygen and hydrogen permeation properties and water uptake of Nafion 117 membrane and recast film for design of PEM fuel cell

7732-18-5, processes

uptake of; in oxygen and hydrogen permeation properties and water uptake of Nafion 117 membrane and recast film for design of PEM fuel cell

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126:229708

The use of solid phase reactors as the source of a catalytic solution. The indirect flow-injection spectrophotometric determination of amino acids.

Torro, I. Gil; Mateo, J.V. Garcia; Calatayud, J. Martinez (Departamento de Quimica Analitica, Universidad de Valencia, Valencia 46100, Spain). J. Braz. Chem. Soc., 8(1), 59-64 (English) 1997 Sociedade Brasileira de Quimica CODEN: JOCSET. ISSN: 0103-5053.

DOCUMENT TYPE: Journal CA Section: 64 (Pharmaceutical Analysis)

The indirect detn. of amino acids is carried out in a flow-injection assembly by means of a solid-phase reactor contg. cupric salts, immobilized in polyester resin beads. A pharmaceutical substance is

forced through the reactor and the released cupric ions (complexed by the pharmaceutical substance) act as a catalyst for the subsequent reaction between Fe(III) and sodium thiosulfate. The calibration graph is linear over the range 0.1-3.0 mg mL⁻¹ glycine, the RSD was 2.3%, and the sample throughput was 28 h⁻¹. The influence of foreign substances was studied and the method was applied to the detn. of glycine in two different pharmaceutical formulations.

Keywords

spectrophotometry amino acid detn pharmaceutical

Index Entries

Pharmaceutical analysis

Spectrophotometry

Amino acids, analysis

detn. of amino acids in pharmaceuticals by indirect flow-injection

spectrophotometry

50-48-6

50-53-3, analysis

50-55-5

51-43-4

51-55-8, analysis

54-85-3

56-40-6, analysis

58-15-1

58-39-9

58-93-5

59-42-7

59-46-1

60-87-7

61-33-6, analysis

65-23-6

68-89-3

72-69-5

76-74-4

79-57-2

80-35-3

92-13-7

98-92-0

98-96-4

103-90-2

114-86-3

299-42-3

509-67-1

564-25-0

657-24-9

723-46-6

738-70-5

3731-59-7

7439-89-6, analysis

14769-73-4

22275-34-9

45086-03-1

62571-86-2

99614-02-5

66-71-7

7440-50-8, uses

detn. of amino acids in pharmaceuticals by indirect flow-injection

spectrophotometry

Process for producing planoconvex lenses.

Wichterle, Otto (Ustav Makromolekularni Chemie Csav, Czech Rep.).

Czech Rep. CZ 280900 B6 15 May 1996, 4 pp. (Czech Republic).

CODEN: CZXXED. CLASS: IC: B29D011-00. APPLICATION: CZ

89-2589 26 Apr 1989. DOCUMENT TYPE: Patent CA Section: 38

(Plastics Fabrication and Uses) Section cross-reference(s): 63

A controlled amt., e.g., (³1) droplet of a monomer mixt. contg. catalyst is placed on a smooth, planar support, the surface of which has a wetting angle ³1° for the monomer mixt., the substrate is subjected to vibration, and the mixt. polyimd. in an inert atm. The shape of the liq. droplet on the support and the dioptric power of the lens is detd. by the wetting angle which can be changed as needed. Thus, 250 lenses (av. diam. 4.8 mm), useful as starting material for making intraocular implants, were prepd. by dispensing 7-mL droplets of 100:1:0.5 2-hydroxyethyl methacrylate-methacrylic acid-ethylene glycol dimethacrylate mixt. contg. 0.4 parts (Me2CHOCO2)2 on a single, rotating polypropylene disk, then vibrating the whole for 5 min, placing a chunk of dry ice on the covered disk and heating the assembly for 30 min at 70°.

Keywords

acrylic planoconvex lens manuf device
hydroxyethyl methacrylate copolymer intraocular lens manuf
polypropylene substrate polyacrylate droplet lens manuf
casting acrylate monomer droplet lens manuf

Index Entries

Intraocular lenses
planoconvex; process for producing planoconvex acrylic copolymer lenses
Casting of polymeric materials
process for producing planoconvex acrylic copolymer lenses
9003-07-0
cast-molding support; process for producing planoconvex acrylic copolymer lenses
33410-59-2
process for producing planoconvex acrylic copolymer lenses

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126:188503

Instantaneously rechargeable voltaic cell.

Presti, Francesco (Presti, Francesco, Italy). Eur. Pat. Appl. EP 756346

Al 29 Jan 1997, 13 pp. DESIGNATED STATES: R: AT, BE, CH, DE,

DK, ES, FI, FR, GB, IT, LI, NL, PT, SE. (European Patent

Organization). CODEN: EPXXDW. CLASS: ICM: H01M006-26. ICS:

H01M006-32. APPLICATION: EP 96-830378 3 Jul 1996. PRIORITY:

IT 95-RM512 26 Jul 1995. DOCUMENT TYPE: Patent CA Section: 52

(Electrochemical, Radiational, and Thermal Energy Technology)

The cell comprises at least a single component, elec. serially connected and in fluid communication with other eventual components, each one comprising a container having ³1 open end, and anode element, provided with openings for the circulation of fluid, and a cathode element, provided within the anode element. The opened ends of the plurality of single components are in fluid serial communication by manifolds, and a catalyst liq. is introduced within the sealed assembly made up of the single components and the manifold.

Keywords

voltaic cell instantaneously rechargeable

Index Entries

Secondary batteries
instantaneously rechargeable voltaic cell

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126:187002

Vestoplast hot-melt adhesives. Advantages for the user and the environment.

Wey, H. G.; Mueller, B. (HULS A. G., Germany). Rev. Plast. Mod., 72(486), 606-613 (Spanish) 1996 Asociacion para el Fomento de la Ciencia y de la Tecnica CODEN: RPMOAM. ISSN: 0034-8708.

DOCUMENT TYPE: Journal CA Section: 38 (Plastics Fabrication and Uses)

Hot-melt polyolefin adhesives based on ethene, propene and butene monomers, prep'd. via Ziegler catalyst polymn. have properties that can be tailored to specific applications and do not present occupational exposure problems, e.g., as carcinogens. Formulation compns. are described and application examples are given for Vestoplast 792, Vestoplast 750, Vestoplast 708. Applications include assembly of wood furniture, coating of surfaces with decorative paper, road sign paints, diaper adhesive tape, etc. The polyolefin adhesives are recyclable, e.g., into polypropylene fiber for carpeting, or as feedstock for petrochems.; most products are biodegradable.

Keywords

polyolefin Vestoplast hot melt adhesive

Index Entries

Hot-melt adhesives

Paints

Recycling of polymeric materials

Polyolefins

stability and usefulness and recycling technologies for polyolefin

Vestoplast hot-melt adhesives

25895-47-0

stability and usefulness and recycling technologies for polyolefin

Vestoplast hot-melt adhesives

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126:86326

Protein disulfide isomerase: A multifunctional protein.

Mimic-Oka, Jasmina (Institute Biochemistry, Faculty Medicine, Belgrade, Yugoslavia). Iugosl. Physiol. Pharmacol. Acta, 32(2), 57-73

(English) 1996 Unija Bioloskih Naucnih Drustava Jugoslavijske CODEN:

IPPABX. ISSN: 0021-3225. DOCUMENT TYPE: Journal; General

Review CA Section: 7 (Enzymes) Section cross-reference(s): 6

A review with 74 refs. A variety of developments have re-awakened interest in the post-translational processes leading to functional protein expression in the cell, particularly folding, targeting and assembly.

Cell biol. and genetic approaches are identifying factors phys. assocd.

with nascent proteins and gene products essential for the functional

protein expression. To overcome alterations in native protein structure,

the cell has evolved mol. chaperones and specific enzymes, foldases.

Protein disulfide isomerase (PDI, EC 5.4.3.1), uniquely, belongs to the

both lists. In this review we summarize the evidence that PDI is a

multifunctional protein. In addn. to its primary function as a catalyst of

native disulfide formation and folding, PDI has three other

well-established functions: as a subunit of the enzyme prolyl

4-hydroxylase, as a component of a microsomal triacylglycerol transfer

protein (MTP), and a mol. chaperone function. The extensive

characterization of the cellular and subcellular distribution of PDI polypeptide, its structure and strong homologies in sequence with several other polypeptides, unrelated to protein biosynthesis, suggests that there is a family of PDI-like proteins.

Keywords

protein disulfide isomerase multifunction review

Index Entries

Proteins (specific proteins and subclasses)
MTP (microsomal triglyceride-exchanging protein); protein disulfide isomerase as multifunctional protein
Chaperonins
protein disulfide isomerase as multifunctional protein
9028-06-2
37318-49-3
protein disulfide isomerase as multifunctional protein

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126:31599

Self-assembly of N-phosphoamino acids.

Yong, Ju; Zhao, Yu-Fen; Chen, Yi (Department Chemistry, Tsinghua University, Beijing 100084, Peop. Rep. China). Pept.: Biol. Chem., Proc. Chin. Pept. Symp., 3rd, Meeting Date 1994, 17-19. Edited by: Lu, Gui-Shen; Tam, James P.; Du, Yu-Cang. ESCOM: Leiden, Neth. (English) 1995. CODEN: 63QWA5. DOCUMENT TYPE: Conference
CA Section: 34 (Amino Acids, Peptides, and Proteins)
This symposium report discusses properties of N-phosphorylamino acids. For example, in the absence of any catalyst or activators, N-phosphorylamino acids can form phosphoryldipeptides and even tripeptides as in the case of phosphorylhistidine. Whereas, no peptides formed when other types of N-protected amino acids, such as Boc-Pro or Chz-Gly, were incubated in n-butanol for 15 h. The participation of the phosphoryl group may be important to the function of phosphorylated enzymes in many bioprocesses.

Keywords

phosphorylamino acid homopeptide formation symposium
self activating phosphoamino acid peptide coupling

Index Entries

Amino acids, reactions
N-phosphoryl; self-activation of N-phosphoamino acids to form homopeptides
Peptides, preparation
homo-, N-phosphoryl; self-activation of N-phosphoamino acids to form homopeptides
Peptide coupling
self-activation of N-phosphoamino acids to form homopeptides

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128:285863

A metal foil having reduced permanent thermal expansion for use in a catalyst assembly, and a method for making the same.
Hughes, Ernest W. (Engelhard Corp., USA). PCT Int. Appl. WO 9814273 A1 9 Apr 1998, 36 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU,

SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: B01J037-02.

APPLICATION: WO 97-US17078 30 Sep 1997. PRIORITY: US

96-725107 2 Oct 1996. DOCUMENT TYPE: Patent CA Section: 59

(Air Pollution and Industrial Hygiene) Section cross-reference(s): 67

A metal foil has improved resistance to permanent thermal expansion. This metal foil includes a metal foil substrate and a thin barrier layer on at least one surface of the metal foil substrate. The metal foil can be used in a catalyst assembly to provide a catalyst support having improved resistance to permanent thermal expansion. The catalyst assembly includes a metal foil substrate and a thin barrier layer on at least one surface of the metal foil substrate. A catalyst material is provided on at least a portion of the barrier layer. This invention further relates to a method for reducing permanent thermal expansion of a metal foil. This method includes applying a barrier layer coating to at least one surface of a metal foil substrate. The method further can include the step of applying a catalyst material to at least a portion of the barrier layer.

Keywords

metal foil reduced thermal expansion
exhaust gas catalytic converter metal foil

Index Entries

Catalyst supports

Catalytic reactors

metal foil having reduced permanent thermal expansion for use in a catalyst assembly, and a method of making the same

Catalysts

Exhaust gases (engine)

Alkaline earth oxides

Group IIIA element oxides

Group IVA element oxides

metal foil having reduced permanent thermal expansion for use in catalyst assembly, and method for making the same

1305-78-8, uses

1309-48-4, uses

1314-23-4, uses

1344-28-1, uses

7439-91-0, uses

7440-45-1, uses

7631-86-9, uses

13463-67-7, uses

42611-06-3

7697-37-2, uses

1309-42-8

21645-51-2, processes

metal foil having reduced permanent thermal expansion for use in catalyst assembly, and method for making the same

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129:275602

Self-Assembly Mediated by the

Donor-Donor-Acceptor*Acceptor-Acceptor-Donor (DDA*AAD)

Hydrogen-Bonding Motif: Formation of a Robust Hexameric Aggregate.

Kolotuchin, Sergei V.; Zimmerman, Steven C. (Department of Chemistry, University of Illinois, Urbana, IL 61801, USA). J. Am. Chem. Soc., 120(35), 9092-9093 (English) 1998 American Chemical Society.

CODEN: JACSAT. ISSN: 0002-7863. DOCUMENT TYPE: Journal
CA Section: 22 (Physical Organic Chemistry)

The prepn. of monomer I and a dendrimer analog are described. The hexameric disk-shaped hydrogen-bonded cyclic aggregate is established by size exclusion chromatog. and its S_6 symmetry is detd. by mol. modeling; the formation const. for the hexamer was not detd. The 1H NMR of the dendrimer, of I and its aggregate, and similar hydrogen-bonded aggregates were discussed. The mass spectra of I and its dendrimer analog were also discussed.

Keywords

selfassembly hydrogen bond hexameric aggregate

Index Entries

Molecular modeling

CPK; formation of robust hexameric aggregate by self-assembly
via donor-donor-acceptor*acceptor-acceptor-donor
(DDA*AAD) hydrogen-bonding motif

Overhauser effect

Overhauser spectroscopy

NOESY; formation of robust hexameric aggregate by
self-assembly via

donor-donor-acceptor*acceptor-acceptor-donor
(DDA*AAD) hydrogen-bonding motif

COSY spectroscopy

Hydrogen bond

Mass spectra

Molecular association

Proton NMR spectroscopy

Self-assembly

Self-association

Size-exclusion chromatography

Supramolecular structure

Symmetry

Monomers

formation of robust hexameric aggregate by self-assembly via
donor-donor-acceptor*acceptor-acceptor-donor
(DDA*AAD) hydrogen-bonding motif

Polymers, properties

hydrogen bonded hexamer; formation of robust hexameric
aggregate by self-assembly via

donor-donor-acceptor*acceptor-acceptor-donor
(DDA*AAD) hydrogen-bonding motif

NMR (nuclear magnetic resonance)

Nuclear shielding

1H ; formation of robust hexameric aggregate by self-assembly via
donor-donor-acceptor*acceptor-acceptor-donor
(DDA*AAD) hydrogen-bonding motif

13965-03-2

14221-01-3

catalyst in dendrimer analog prepn.; formation of robust hexameric
aggregate by self-assembly via

donor-donor-acceptor*acceptor-acceptor-donor
(DDA*AAD) hydrogen-bonding motif

213680-87-6

213762-77-7

503-69-5

827-94-1

24424-99-5

213680-82-1

213680-88-7

213680-83-2

213680-84-3
 213680-86-5
 213680-90-1
 213680-89-8
 formation of robust hexameric aggregate by self-assembly via
 donor-donor-acceptor*acceptor-acceptor-donor
 (DDA×AAD) hydrogen-bonding motif
 74-88-4, reactions
 106-41-2
 109-89-7, reactions
 115-19-5
 121-43-7
 626-44-8
 in dendrimer analog prepn.; formation of robust hexameric
 aggregate by self-assembly via
 donor-donor-acceptor*acceptor-acceptor-donor
 (DDA×AAD) hydrogen-bonding motif
 213680-85-4
 in monomer and dendrimer analog prepn.; formation of robust
 hexameric aggregate by self-assembly via
 donor-donor-acceptor*acceptor-acceptor-donor
 (DDA×AAD) hydrogen-bonding motif
 626-40-4
 6311-60-0
 25458-45-1
 41136-79-2
 144001-02-5
 162662-27-3
 213680-95-6
 213680-96-7
 213680-97-8
 213680-98-9
 213680-99-0
 213681-00-6
 synthetic intermediate in dendrimer analog prepn.; formation of
 robust hexameric aggregate by self-assembly via
 donor-donor-acceptor*acceptor-acceptor-donor
 (DDA×AAD) hydrogen-bonding motif
 117699-89-5
 140659-69-4
 213680-93-4
 1H NMR of hydrogen bonded heterodimer; formation of robust
 hexameric aggregate by self-assembly via
 donor-donor-acceptor*acceptor-acceptor-donor
 (DDA×AAD) hydrogen-bonding motif
 213680-91-2
 213680-92-3
 1H NMR; formation of robust hexameric aggregate by
 self-assembly via
 donor-donor-acceptor*acceptor-acceptor-donor
 (DDA×AAD) hydrogen-bonding motif

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128:61854
 Synthesis of columnar polyacetylenes by Rh complex catalyst.
 Tabata, Masayoshi; Sone, Takeyuki; Sadahiro, Yoshikazu; Yang, Wu;
 Kobayashi, Shin; Inaba, Yasuo; Yokota, Kazuaki (Graduate School of
 Engineering, Dep. of Molecular Chemistry, Hokkaido University,
 Sapporo 060, Japan). Kobunshi Ronbunshu, 54(12), 863-874
 (Japanese) 1997 Kobunshi Gakkai. CODEN: KBRBA3. ISSN:
 0386-2186. DOCUMENT TYPE: Journal CA Section: 35 (Chemistry of
 Synthetic High Polymers) Section cross-reference(s): 67
 Highly stereoregular polymn. of phenylacetylene and its homologues
 were performed using a Rh complex catalyst, i.e.,

[Rh(norbornadiene)Cl]₂ to give rise to polyacetylenes bearing high cis content in the presence of triethylamine or alc. as the polymn. solvent. These solvents were considered to dissociate the dimer complex catalyst to generate monomeric species as a possible propagation species of this polymn. Living like polymn. of m-chlorophenylacetylene was achieved when a mixed solvent of chloroform and triethylamine was used. A solvent treatment of the pristine amorphous polymer using toluene induced formation of pseudo-hexagonal column called self-assembly. Pressure induced cis-trans isomerization took place to generate fairly long trans conjugate sequences when pressure was exerted on the arom. polyacetylene polymer at room temp. under vacuum. The obtained trans conjugated sequences stabilized so-called soliton radicals as the mobile unpaired electron whose g value is comparable to that of the free electron.

Keywords

columnar polyacetylene prepn rhodium complex catalyst
stereoregular polymn columnar polyacetylene rhodium catalyst
phenylacetylene deriv polymn rhodium complex catalyst

Index Entries

Color

Crystallites

structure and properties of columnar polyacetylenes prepd. by Rh complex catalyst in various solvents

cis-trans Isomerization

structure of columnar polyacetylenes prepd. by Rh complex catalyst in various solvents

Polymer chains

structure; structure of columnar polyacetylenes prepd. by Rh complex catalyst in various solvents

Living polymerization

Living polymerization catalysts

Solvent effect

Stereospecific polymerization

Polyacetylenes, preparation

synthesis of columnar polyacetylenes by Rh complex catalyst in various solvents

12012-95-2

12112-67-3

catalyst; synthesis of columnar polyacetylenes by Rh complex catalyst in various solvents

12092-47-6

12257-42-0

41371-55-5

25038-69-1

26797-70-6

26797-71-7

synthesis of columnar polyacetylenes by Rh complex catalyst

64-17-5, uses

67-56-1, uses

71-23-8, uses

71-43-2, uses

75-65-0, uses

96-41-3

108-88-3, uses

108-93-0, uses

109-99-9, uses

121-44-8, uses

766-97-2

120884-58-4

146088-29-1

152795-97-6

synthesis of columnar polyacetylenes by Rh complex catalyst in various solvents

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129:194864

Self-assembly and catalytic properties of 1,1'-bridged-2,2'-dipyridinium amphiphiles.

Judkins, Christy M.; Bohannon, Eric W.; Herbig, A. Katherine; Powers, Janette A.; Van Galen, Dean A. (Division of Science, Truman State University, Kirksville, MO 63501, USA). J. Electroanal. Chem., 451(1-2), 39-47 (English) 1998 Elsevier Science S.A. CODEN: JECHES. ISSN: 0368-1874. DOCUMENT TYPE: Journal CA Section: 72 (Electrochemistry) Section cross-reference(s): 22, 25, 66

An electrochem. and computational study of three 4-methyl-4'-nonadecyl-1,1'-bridged-2,2'-dipyridinium ions is reported. In 0.1M KCl these ions self-assemble on glassy carbon to form a close-packed monomol. layer. Incorporation of perchlorate into the film by counterion exchange results in enhanced film stability and limiting surface coverages of $\sim 1.7 \times 10^{-10}$ mol cm⁻². As the 1,1'-bridge length is increased from two to four methylene groups, the reversible 1-electron redn. potential of the dipyridinium head group decreases from -499 to -833 mV vs. Ag|AgCl|0.1M KCl. These relatively neg. redn. potentials make adsorbed 1,1'-bridged-2,2'-dipyridinium amphiphiles powerful immobilized reductants in aq. soln. The catalytic potency of these amphiphiles is demonstrated by catalyzing the redn. of Et 3-benzoylacrylate and artemisinin.

Keywords

selfassembly catalytic bridged dipyridinium amphiphile
methylnonadecylpolymethylenedipyridinium catalyst electroredn ethyl
benzoylacrylate artemisinin

Index Entries

Electrochemical reduction catalysts
bridged methylnonadecylbipyridinium self-assembly films on
glassy carbon for redn. Et benzoylacrylate and artemisinin
Chemically modified electrodes
bridged methylnonadecylbipyridinium self-assembly on glassy
carbon
Adsorbed monolayers
methylnonadecylbipyridinium self-assembly films on glassy carbon
for electrocatalysts for redn. of Et benzoylacrylate and
artemisinin
Electrochemical reduction
of Et benzoylacrylate and artemisinin on glassy carbon with bridged
methylnonadecylbipyridinium self-assembly films
Reduction potential
of adsorbed bridged methylnonadecylbipyridinium amphiphiles on
glassy carbon
Adsorption
Self-assembly
of bridged methylnonadecylbipyridinium on glassy carbon in aq.
KCl soln. for electrocatalysts for redn. of Et benzoylacrylate
and artemisinin
Cyclic voltammetry
of glassy carbon electrode modified with self-assembly of bridged
methylnonadecylbipyridinium in potassium perchlorate soln.
with and without Et benzoylacrylate or artemisinin
Amphiphiles
self-assembly and catalytic properties of bridged dipyridinium
amphiphiles
Glassy carbon electrodes

self-assembly of bridged methylnonadecylbipyridinium on glassy carbon in aq. KCl soln. for electrocatalysts for redn. of Et benzoylacrylate and artemisinin

79957-90-7

adsorption by glassy carbon and comparison with bridged methylnonadecylbipyridinium self-assembly films

14797-73-0

incorporation by anion exchange in bridged methylnonadecylbipyridinium self-assembly films on glassy carbon for electrocatalysts for redn. of Et benzoylacrylate and artemisinin

211863-40-0

211863-41-1

211863-42-2

prepn. and catalysts for electrochem. redn. of Et benzoylacrylate and artemisinin: self-assembly and catalytic properties of bridged dipyridinium amphiphiles

85796-69-6

reaction with dibromoalkanes

106-93-4

109-64-8

110-52-1

reaction with nonadecylmethylbipyridine

17450-56-5

63968-64-9

self-assembly of bridged methylnonadecylbipyridinium on glassy carbon for electrocatalysts for redn. of

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129:218217

Optimization of Palladium-Based Supported Liquid-Phase Catalysts in the Heck Reaction.

Mirza, Amin R.; Anson, Michael S.; Hellgardt, Klaus; Leese, Matthew P.; Thompson, David F.; Tonks, Louise; Williams, Jonathan M. J.

(School of Chemistry, University of Bath, Bath BA2 7AY, UK). Org.

Process Res. Dev., 2(5), 325-331 (English) 1998 American Chemical

Society. CODEN: OPRDFK. ISSN: 1083-6160. DOCUMENT TYPE:

Journal CA Section: 45 (Industrial Organic Chemicals, Leather, Fats, and Waxes) Section cross-reference(s): 67

Heck reactions using sulfonated triphenylphosphine palladium complexes were carried out using a supported liq.-phase catalysis system in a batch reactor. The catalyst complex is held in soln. in a polar, hydrophilic film supported upon porous glass beads while reactants and products are restricted to a non-miscible solvent phase. Several factors in the prepn. of the supported catalyst were studied with the aim of ensuring good assembly, distribution, and immobilization of the catalyst complex across the surface of the beads. The thickness of the hydrophilic film upon the porous glass beads was varied. The hydrophilic nature of the ligand complex was studied using mono- and trisulfonated sodium and lithium salts of triphenylphosphine. The effects of level of catalyst loading and ligand/catalyst ratio upon leaching and activity were also examd.

Keywords

sodium triphenylphosphine palladium complex catalyst
Heck reaction triphenylphosphine palladium supported catalyst
porous glass support palladium triphenylphosphine catalyst

Index Entries

Porous glass
CPG-350 and 700, catalyst support; optimization of
palladium-sulfonated triphenylphosphine supported

liq.-phase catalysts and activity in Heck arylation reactions
 Arylation
 Arylation catalysts
 Heck reaction; optimization of palladium-sulfonated
 triphenylphosphine supported liq.-phase catalysts and
 activity in Heck arylation reactions
 Reaction kinetics
 arylation kinetics, Heck reaction; optimization of
 palladium-sulfonated triphenylphosphine supported
 liq.-phase catalysts and activity in Heck arylation reactions
 Glass spheres
 catalyst support; optimization of palladium-sulfonated
 triphenylphosphine supported liq.-phase catalysts and
 activity in Heck arylation reactions
 Arylation
 kinetics, Heck reaction; optimization of palladium-sulfonated
 triphenylphosphine supported liq.-phase catalysts and
 activity in Heck arylation reactions
 Catalyst supports
 Hydrophilicity
 Leaching
 Pore size distribution
 Solvation
 Surface area
 optimization of palladium-sulfonated triphenylphosphine supported
 liq.-phase catalysts and activity in Heck arylation reactions
 107-21-1, uses
 7631-86-9, uses
 catalyst support; optimization of palladium-sulfonated
 triphenylphosphine supported liq.-phase catalysts and
 activity in Heck arylation reactions
 7440-05-3, uses
 7647-10-1
 63995-70-0
 63995-75-5
 111831-40-4
 1754-62-7
 96-33-3
 109-72-8, reactions
 591-50-4
 603-35-0, reactions
 1079-66-9
 1310-73-2, reactions
 7446-11-9, reactions
 7664-93-9, reactions
 7719-12-2
 30215-10-2
 111831-26-6
 optimization of palladium-sulfonated triphenylphosphine supported
 liq.-phase catalysts and activity in Heck arylation reactions

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128:194370

Catalytic reactor designed to reduce catalyst slumping and crushing.
 Sederquist, Richard A.; Corrigan, Thomas J.; Szydlowski, Donald F.;
 Bonk, Stanley P. (International Fuel Cells, Inc., USA). U.S. US
 5718881 A 17 Feb 1998, 6 pp. (English). (United States of America).
 CODEN: USXXAM. CLASS: ICM: C01B003-26. ICS: B01J008-06.
 NCL: 423652000. APPLICATION: US 96-669187 24 Jun 1996.
 DOCUMENT TYPE: Patent CA Section: 49 (Industrial Inorganic
 Chemicals) Section cross-reference(s): 51, 52
 A steam reformer for converting a reactor fuel into a product gas
 includes a segmented catalyst bed. The steam reformer side walls
 have a thermal coeff. of expansion which is greater than the thermal

coeff. of expansion of the catalyst. By forming low vol. catalyst bed segments in the hotter portions of the catalyst bed, slumping and subsequent damage of the catalyst pellets is minimized. The catalyst bed is divided into segments whose vols. are inversely proportional to the temps. of the various zones in the reformer. The segments are formed by utilizing sequential catalyst support assemblies which include perforated catalyst support members that are differentially spaced apart from each other by support assembly legs having varying lengths. Catalyst support assemblies with shorter length legs are used in the hotter zones of the reformer, and support assemblies with progressively longer length legs are used in the cooler zones of the reformer.

Keywords

steam reforming catalytic reactor
reduced slumping crushing steam reforming reactor

Index Entries

Steam reforming fuel gas manufacturing
app.; catalytic reactor designed to reduce catalyst slumping and crushing
Steam reforming catalysts
Steam reforming fuel gas manufacturing
catalytic reactor designed to reduce catalyst slumping and crushing

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129:20123

Catalyst basket for an exothermic reaction of a gas mixture in the presence of a catalyst.

Duponteil, Gilbert (Babcock Entreprise, Fr.). Fr. Demande FR 2756498 A1 5 Jun 1998, 11 pp. (French). (France). CODEN: FRXXBL. CLASS: ICM: B01J012-00. ICS: B01J032-00. ICA: C01C003-02; C01B021-28. APPLICATION: FR 96-14699 29 Nov 1996. DOCUMENT TYPE: Patent CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms) Section
cross-reference(s): 47

The title invention is of a type comprising an upper envelope under pressure, provided with an arrival tube of the gas and joined to the upper part of a container, for warming by recovery or exchange of heat, by the intermediary of 2 clamps, an assembly comprising catalyst gauzes, a refractory material and a support of this material, a device guiding the gas on the catalyst gauzes, and the support of the assembly, as well as means of cooling for thermally protecting the envelope and the upper part of the container. The catalyst basket is characterized in that the clamp of said device of guiding and the support are formed of an assembly cooled by the circulation of a cooling fluid. The invention is useful in the domain of exothermic reactions of a gas mixt. in the presence of a catalyst.

Keywords

catalyst basket exothermic reaction gas mixt

Index Entries

Catalysts
Exothermic reaction
Gaseous mixtures
catalyst basket for exothermic reaction of a gas mixt. in the presence of a catalyst

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128:184059

Environmental control system incorporating a dual bed reactor for the decomposition of ozone and removal of organics.

Walenga, Joel T.; Homeyer, Stephen T.; Lehane, Colleen A.; Tom, Robert; Westelaken, William; Pollitt, Stan C.; Mikolajczyk, Sara J.; Snyder, James R.; Lester, George R. (AlliedSignal Inc., USA). PCT Int. Appl. WO 9806479 A1 19 Feb 1998, 85 pp. DESIGNATED STATES:

W: JP; RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). (World Intellectual Property Organization).

CODEN: PIXXD2. CLASS: ICM: B01D053-86. ICS: B01J015-00;

B01J023-38. APPLICATION: WO 97-US14495 18 Aug 1997.

PRIORITY: US 96-699099 16 Aug 1996. DOCUMENT TYPE: Patent

CA Section: 59 (Air Pollution and Industrial Hygiene)

The environment control system for use in a transportation machine is effective for receiving and conditioning a heated airstream contg. org. compds. and ozone, prior to delivering the airstream to a habitable space within the machine, e.g., an automobile. The system includes a dual bed reactor having an upstream portion which is effective for converting org. compds. within the airstream into carbon dioxide and water, and a downstream portion which is effective for decomp. ozone within the airstream. Both the upstream and downstream portions of the core structure include at least one fin assembly. Each portion may include a plurality of the fin assemblies, configured as annular rings and generally concentrically disposed relative to one another. Alternatively, each portion of the reactor may comprise a single fin assembly which is wrapped upon itself in a spiral configuration. Radially adjacent ones of the fin assemblies of each portion, or radially adjacent spirals of the individual fin assembly of each portion, are brazed to one another to prevent nesting between radially adjacent ones of the fin assemblies or spirals. Each fin assembly of the upstream portion is anodized, with a catalyst which is effective for converting org. compds. into carbon dioxide and water being disposed on and within the resulting anodized surface layer. Each fin assembly of the downstream portion may be similarly anodized, with application of a catalyst effective for decomp. ozone, or alternatively, each fin assembly of the downstream portion may be constructed from a catalytically-active metal alloy.

Keywords

ozone decompn catalyst automobile air conditioning

org decompn catalyst automobile air conditioning

Index Entries

Indoor air pollution

automobile; environmental control system incorporating a catalytic reactor for the decompn. of ozone

Decomposition catalysts

Oxidation catalysts

environmental control system incorporating a catalytic reactor for the decompn. of ozone

Hydrocarbons, processes

pollutant; environmental control system incorporating a catalytic reactor for the decompn. of ozone

7446-09-5, miscellaneous

catalyst poison; environmental control system incorporating a

catalytic reactor for the decompn. of ozone

1344-28-1, uses

catalyst support; environmental control system incorporating a

catalytic reactor for the decompn. of ozone

7440-22-4, uses

199673-75-1

10028-15-6, processes

environmental control system incorporating a catalytic reactor for the decompn. of ozone

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129:141844

Activation and characterization of Fe-based catalysts for the reduction of oxygen in polymer electrolyte fuel cells.

Faubert, G.; Cote, R.; Guay, D.; Dodelet, J. P.; Denes, G.; Poleunis, C.; Bertrand, P. (INRS-Energie Materiaux, Varennes, PQ, Can.).

Electrochim. Acta, 43(14-15), 1969-1984 (English) 1998 Elsevier

Science Ltd. CODEN: ELCAAV. ISSN: 0013-4686. DOCUMENT

TYPE: Journal CA Section: 72 (Electrochemistry) Section

cross-reference(s): 52, 55, 67

Fe-based catalysts for the redn. of oxygen in polymer electrolyte fuel cells (PEFCs) have been prepd. from a precursor contg. 10 wt% Fe as Fe(OH)₂ adsorbed on carbon black (Fe(OH)₂/C). Activation of the precursor was performed in two steps: (i) H₂ redn. at 600°; (ii) pyrolysis in acetonitrile (AN) vapor at various temps. (400, 600, 800, 1000°).

The electrocatalytic properties of all catalysts were tested in rotating disk electrode (RDE) expts. and in single H₂/O₂ gas diffusion electrode (GDE) assemblies. Catalysts for O₂ redn. were obtained for Fe(OH)₂/C pyrolyzed at 600°C and higher. Stable currents in the fuel cell assembly were obsd. for the catalysts prepd. at 800° and higher. Leaching the excess iron from the catalysts by exposure to an H₂SO₄ soln. increased their catalytic activities. Exposure of the acid leached catalyst prepd. at 1000°C to Cl₂ at 650°C removed addnl. quantities of excess iron and increased the catalyst activity even further. The catalyst obtained after these treatments retained an iron content of 3.3 wt%. The survival of the catalytic activity obtained after these treatments retained an iron content of 3.3 wt%. The survival of the catalytic activity in that material even after the Cl₂ treatment suggests that either Fe is not a constituent of the active site. In this case, its role would be limited to catalyzing the formation of the carbon and nitrogen based active site.

The XRD, XPS, ToF-SIMS and TEM analyses performed on the catalysts prepd. during this study were inconclusive in resolving this issue as they all were dominated by the presence of inactive iron particles and AN pyrolysis products.

Keywords

iron based catalyst precursor oxygen redn
fuel cell iron based catalyst

Index Entries

Adsorbed substances

Fe(OH)₂ on carbon black in formation of Fe-based catalysts for the redn. of oxygen in polymer electrolyte fuel cells

Electrochemical reduction catalysts

activated iron clusters on carbon black for oxygen

X-ray diffraction

by Fe-based catalysts for the redn. of oxygen in polymer electrolyte fuel cells

Polyoxyalkylenes, uses

fluorine- and sulfo-contg., ionomers; in fabrication of electrolytic cell for electrochem. redn. of oxygen with Fe-based catalysts

Binding energy

in Fe-based catalysts for the redn. of oxygen, by XPS

Leaching

in activation of precursor of Fe-based catalysts for the redn. of oxygen in H₂SO₄ soln.

Carbon black, uses

in prepn. of iron-based catalyst for the redn. of oxygen in polymer electrolyte fuel cells

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in testing of Fe-based catalysts for the redn. of oxygen
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Mass spectra
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Electrochemical reduction
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Solid state fuel cells
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7782-50-5, properties
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7439-89-6, properties
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7664-93-9, properties
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67-56-1, uses
75-59-2
7720-78-7
in prepn. of iron-based catalyst for the redn. of oxygen in polymer
electrolyte fuel cells
75-05-8, properties
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in polymer electrolyte fuel cells
18624-44-7
redn. in H_2 and pyrolysis in acetonitrile vapor of adsorbed Fe(OH)_2
on carbon black for iron-based catalyst for the redn. of
oxygen in polymer electrolyte fuel cells

Protein disulfide isomerase acts as a molecular chaperone during the assembly of procollagen.

Wilson, Richard; Lees, Janice F.; Bulleid, Neil J. (School of Biological Sciences, University of Manchester, Manchester M13 9PT, UK). J. Biol. Chem., 273(16), 9637-9643 (English) 1998 American Society for Biochemistry and Molecular Biology. CODEN: JBCHA3. ISSN:

0021-9258. DOCUMENT TYPE: Journal CA Section: 7 (Enzymes)

Protein-disulfide isomerase (PDI) has been shown to be a multifunctional enzyme catalyzing the formation of disulfide bonds, as well as being a component of the enzymes prolyl 4-hydroxylase (P4-H) and microsomal triglyceride transfer protein. It has also been proposed to function as a mol. chaperone during the refolding of denatured proteins in vitro. To investigate the role of this multifunctional protein within a cellular context, we have established a semi-permeabilized cell system that reconstitutes the synthesis, folding, modification, and assembly of procollagen as they would occur in the cell. We demonstrate here that P4-H assoc. transiently with the triple helical domain during the assembly of procollagen. The release of P4-H from the triple helical domain coincides with assembly into a thermally stable triple helix. However, if triple helix formation is prevented, P4-H remains assocd., suggesting a role for this enzyme in preventing aggregation of this domain. We also show that PDI assoc. independently with the C-propeptide of monomeric procollagen chains prior to trimer formation, indicating a role for this protein in coordinating the assembly of heterotrimeric mols. This demonstrates that PDI has multiple functions in the folding of the same protein, i.e., as a catalyst for disulfide bond formation, as a subunit of P4-H during proline hydroxylation, and independently as a mol. chaperone during chain assembly.

Keywords

protein disulfide isomerase chaperone procollagen folding

Index Entries

Protein folding

Chaperonins

Procollagens

protein disulfide isomerase acts as a mol. chaperone during assembly of procollagen

37318-49-3

protein disulfide isomerase acts as a mol. chaperone during assembly of procollagen

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128:272707

Porosity and catalyst utilization of thin layer cathodes in air operated PEM-fuel cells.

Fischer, A.; Jindrai, J.; Wendt, H. (Institute of Chemical Technology, Technical University of Darmstadt, Darmstadt D-64287, Germany). J.

Appl. Electrochem., 28(3), 277-282 (English) 1998 Chapman & Hall.

CODEN: JAELBJ. ISSN: 0021-891X. DOCUMENT TYPE: Journal

CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology)

Better performance of and higher electrocatalyst utilization in proton-exchange membrane fuel cells equipped with thin film electrodes is achieved by exploiting pore forming additives in the electrode recipe formulation. Prepg. the membrane-electrode assembly by a hot spraying procedure already provides 35% porosity.

Addnl. coarse porosity is obtained by adding pore formers to the electrocatalyst slurry which is used for the hot spraying process. This allows for a better access of oxygen from air to the depth of the cathode. For air operation at ambient pressure and low catalyst

loading of 0.15 mg Pt cm⁻² a c.d. of 200 mA cm⁻² at 0.7 V cell voltage can be obtained with such electrodes.

Keywords

fuel cell cathode porosity catalyst utilization

Index Entries

Polyoxyalkylenes, uses
 fluorine- and sulfo-contg., ionomers; porosity and catalyst
 utilization of thin layer cathodes in air operated PEM-fuel
 cells
 Fluoropolymers, uses
 polyoxyalkylene-, sulfo-contg., ionomers; porosity and catalyst
 utilization of thin layer cathodes in air operated PEM-fuel
 cells
 Ionomers
 polyoxyalkylenes, fluorine- and sulfo-contg.; porosity and catalyst
 utilization of thin layer cathodes in air operated PEM-fuel
 cells
 Electrochemical reaction catalysts
 Fuel cell cathodes
 Porosity
 Carbon black, uses
 porosity and catalyst utilization of thin layer cathodes in air
 operated PEM-fuel cells
 7440-06-4, uses
 66796-30-3
 porosity and catalyst utilization of thin layer cathodes in air
 operated PEM-fuel cells

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128:184757

A solid-phase reactor as the catalyst source in a flow-injection assembly. Spectrophotometric determination of thioridazine. Lopez Paz, J. L.; Garcia Mateo, J. V.; Martinez Calatayud, J. (Dpto. Quim. Anal., Univ. Valencia, Valencia, Spain). J. Flow Injection Anal., 14(1), 15-24 (English) 1997 Nippon Bunseki Kagakkai Furo Injekushon Bunseki Kenkyu kondankai. CODEN: JFIAEA. ISSN: 0911-775X. DOCUMENT TYPE: Journal CA Section: 64 (Pharmaceutical Analysis) A flow injection assembly is proposed in which the sample soln. contg. thioridazine was forced through a solid-phase reactor contg. immobilized PbO₂. By subsequent redn. of PbO₂ by thioridazine, Pb(II) is released into the system. The liberated Pb(II) is then merged with a Mn(II)-EDTA complex soln. to unmask Mn(II) which in turn acts as a catalyst in the IO₄--N,N-diethylaniline reaction at pH 7. The product of this last redox reaction is spectrophotometrically monitored 470 nm. The calibration graph is linear over the range 0.25-5.0 mg mL⁻¹ with an RSD of 1.3% and a sample throughput of 39 h⁻¹. The influence of foreign compds. is also studied. The proposed method is applied to the detn. of thioridazine in a pharmaceutical formulation and is also applicable to detn. of other relative compds. such as phenothiazines.

Keywords

thioridazine FIA lead oxide immobilization reactor
 flow injection assembly thioridazine spectrophotometric detn

Index Entries

Pharmaceutical analysis
 solid-phase reactor as catalyst source in a flow-injection
 assembly for spectrophotometric detn. of thioridazine

50-52-2
91-66-7
1309-60-0
7790-28-5

solid-phase reactor as catalyst source in a flow-injection
assembly for spectrophotometric detn. of thioridazine

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128:130191

Electrochemical oxygen sensor having internal catalyst for wide-range
measurement of air/fuel ratio.

Lim, Chang-Bin (Samsung Electro-Mechanics Co., Ltd., S. Korea).

U.S. US 5709787 A 20 Jan 1998, 7 pp. (English). (United States of
America). CODEN: USXXAM. CLASS: ICM: G01N027-27. NCL:

204425000. APPLICATION: US 95-535916 28 Sep 1995. PRIORITY:

KR 94-25202 30 Sep 1994. DOCUMENT TYPE: Patent CA Section:

51 (Fossil Fuels, Derivatives, and Related Products) Section

cross-reference(s): 57

The wide-range sensor for air/fuel gas ratio includes a pump cell sepd.
from sensor cell by a porous diffusion layer contg. 0.1-5 wt.% of a
catalyst to obtain equil. combustion gas for accurate measurement of
the air/fuel ratio in the exhaust stream. The sensor has multilayer
design, and is typically manufd. by assembly and high-temp. firing.
The porous diffusion interlayer is preferably manufd. from Al₂O₃
ceramic contg. 2 wt.% of stabilized ZrO₂ and 3 wt.% Pt as the catalyst.

Keywords

electrochem sensor air fuel ratio exhaust
ceramic oxygen sensor air fuel ratio

Index Entries

Electrochemical sensors

oxygen sensor having internal catalyst for stable measurement of
air/fuel ratio

Exhaust systems (engine)

sensors for; electrochem. oxygen sensor having internal catalyst
for measurement of air/fuel ratio

7439-96-5, uses

7440-02-0, uses

7440-05-3, uses

7440-06-4, uses

7440-16-6, uses

7440-47-3, uses

7440-48-4, uses

7440-50-8, uses

12060-58-1

sensor with; electrochem. oxygen sensor having internal catalyst
for measurement of air/fuel ratio

7782-44-7, uses

sensor; electrochem. oxygen sensor having internal catalyst for
measurement of air/fuel ratio

1314-23-4, uses

1344-28-1, uses

sintered, sensor with; electrochem. oxygen sensor having internal
catalyst for measurement of air/fuel ratio

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128:247656

Recent technology of automotive exhaust catalyst in TOYOTA.

Matsumoto, Shinichi (Mater. Eng. Div. 1, Toyota Mot. Corp., Toyota
471-71, Japan). Zeoraito, 15(1), 5-11 (Japanese) 1998 Zeoraito

Gakkai. CODEN: ZEOREM. ISSN: 0918-7774. DOCUMENT TYPE:
Journal; General Review CA Section: 59 (Air Pollution and Industrial
Hygiene) Section cross-reference(s): 67
A review with 12 refs. Topics covered; a monolithic thin wall substrate
for exhaust gas catalyst carrier, a closed-coupled catalyst assembly
for low-emission car, a new 3-way catalyst for lean-burn engine, and
an effective Diesel oxidizing catalyst at low temp. exhaust.

Keywords

automotive exhaust gas catalyst Japan review

Index Entries

Catalysts

Exhaust gas catalytic converters

Exhaust gases (engine)

recent technol. of automotive exhaust catalyst in TOYOTA

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128:143123

Electrode assembly, fuel cells prepared with this assembly, and
manufacture of fuel cells.

Hoffmann, Hans; Siemonsen, Sven (Hoffmann, Hans; Siemonsen,
Sven; Doblaski, Lutz, Germany). Ger. Offen. DE 19628593 A1 22 Jan
1998, 14 pp. (German). (Germany). CODEN: GWXXBX. CLASS:

ICM: H01M004-86. APPLICATION: DE 96-19628593 16 Jul 1996.
DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical,
Radiational, and Thermal Energy Technology)

The assembly comprises ³1 possibly with catalyst-coated anode and
³1 possibly with catalyst-coated cathode arranged at a given distance
from each other, and the 2 hollow electrodes have a 3-dimensional
latticed structure spatially nested into each other.

Keywords

fuel cell electrode assembly

Index Entries

Fuel cell electrodes

assembly and fuel cells prepd. with this assembly

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128:52452

Assembly method for an exhaust gas catalyst and support mat for
executing this method.

Stoepler, Walter (Leistritz Ag & Co Abgastechnik, Germany). Ger.
Offen. DE 19618656 A1 13 Nov 1997, 6 pp. (German). (Germany).
CODEN: GWXXBX. CLASS: ICM: B01D053-88. ICS: D01F009-08.

APPLICATION: DE 96-19618656 9 May 1996. DOCUMENT TYPE:

Patent CA Section: 59 (Air Pollution and Industrial Hygiene) Section
cross-reference(s): 51, 67

The support mat for the monolithic exhaust gas catalyst is sepd. from
the housing by a sliding layer, which may be a lubricating oil, a plastic
sheet (e.g., polyethylene) or a foil. The sliding layer prevents friction
between the housing and the mat.

Keywords

exhaust gas catalyst support mat lubricant

Index Entries

Exhaust gas catalytic converters

Exhaust gases (engine)

Lubricating oils

Plastics, uses

assembly method for an exhaust gas catalyst and support mat for
executing this method

9002-88-4

assembly method for an exhaust gas catalyst and support mat for
executing this method

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129:278397

A novel process to fabricate membrane electrode assemblies for
proton exchange membrane fuel cells.

Kim, C. S.; Chun, Y. G.; Peck, D. H.; Shin, D. R. (Korea Institute of
Energy Research, Taejon 305-343, S. Korea). Int. J. Hydrogen Energy,
23(11), 1045-1048 (English) 1998 Elsevier Science Ltd. CODEN:
IJHEDX. ISSN: 0360-3199. DOCUMENT TYPE: Journal CA Section:

52 (Electrochemical, Radiational, and Thermal Energy Technology)

A new fabrication method of membrane electrode assembly (MEA) for
proton exchange membrane fuel cells is developed by using
perfluorosulfonyl fluoride copolymer powder and Pt/C catalyst. The
perfluorosulfonyl fluoride copolymer powder is pressed into a sheet at
2300 by hot pressing. The Pt/C catalyst is then coated on to either
side of the sheet by screen printing, followed by hot pressing. During
this process, due to the melt-fabricable property of the pre-formed
sheet, the coated catalyst layer is embedded into the membrane. The
resultant MEA is converted into perfluorosulfonate polymer by
hydrolysis of NaOH soln. The thermal property of the copolymer
powder has been analyzed by DTA-thermogravimetric anal., and the
interfacial contact of the catalyst with the membrane has been also
investigated by SEM. The performance characteristics of the MEA
have been evaluated in a single cell.

Keywords

proton exchange membrane fuel cell

membrane electrode assembly fuel cell

perfluorosulfonate polymer membrane electrode assembly

Index Entries

Fuel cell electrodes

Fuel cell electrolytes

Fuel cells

process for fabrication of membrane electrode assemblies for
proton exchange membrane fuel cells

Fluoropolymers, uses

sulfo-contg.; process for fabrication of membrane electrode
assemblies for proton exchange membrane fuel cells

7440-06-4, uses

catalytic electrode; process for fabrication of membrane electrode
assemblies for proton exchange membrane fuel cells

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129:208541

Electrochemical conversion of anhydrous hydrogen halide to halogens
gas using a membrane-electrode assembly or gas diffusion
electrodes.

Zimmerman, William H.; Saturno, Thomas Frank; Artysiewicz, John
Stanley; Trainham, James Arthur; Law, Clarence Garlan, Jr.; Newman,
John Scott; Eames, Douglas John (E. I. Du Pont De Nemours and Co.,

USA). U.S. US 5798036 A 25 Aug 1998, 14 pp. Cont.-in-part of U.S. Ser. No. 644,551, abandoned. (English). (United States of America).
 CODEN: USXXAM. CLASS: ICM: C25B001-26. NCL: 205620000.
 APPLICATION: US 96-671867 28 Jun 1996. PRIORITY: US 93-156196 22 Nov 1993; US 95-432403 1 May 1995; US 96-644551 10 May 1996. DOCUMENT TYPE: Patent CA Section: 72
 (Electrochemistry) Section cross-reference(s): 49, 67
 The present invention relates to an electrochem. cell and a process for converting anhyd. hydrogen halide to halogen gas using a membrane-electrode assembly (MEA) or a sep. membrane and electrode arrangement, such as gas diffusion electrodes with a membrane. Thus, direct prodn. of chlorine is achieved using by supplying anhyd. HCl to an inlet of an electrochem. cell comprising a cation-transporting membrane, an anode in contact with one side of the membrane and a cathode in contact with the other side and applying a voltage to the anode and cathode so that the anode is at a higher potential than the cathode with HCl oxidized at the anode and H⁺ transported through the membrane and reduced at the cathode.

Keywords

anhyd hydrogen halide electrooxidn membrane cell
 halogen gas prodn membrane cell
 gas diffusion electrode halogen prodn

Index Entries

Halogens

Hydrogen halides

electrochem. conversion of anhyd. hydrogen halide to halogens gas using membrane-electrode assembly or gas diffusion electrodes

Membrane cells

for electrochem. conversion of anhyd. hydrogen halide to halogen gas

Electrochemical oxidation

of hydrogen halide in membrane cell in halogen gas prodn.

Electrochemical oxidation catalysts

ruthenia in fluoropolymer membrane for hydrogen halide 12036-10-1

catalyst in fluoropolymer membrane for cell for electrochem. conversion of anhyd. hydrogen halide to halogen gas

7782-50-5, preparation

7647-01-0, reactions

electrochem. conversion of anhyd. hydrogen chloride to chlorine gas using membrane-electrode assembly or gas diffusion electrodes

26654-97-7, hydrolyzed

membrane contg. ruthenia catalyst for cell for electrochem.

conversion of anhyd. hydrogen halide to halogen gas

1333-74-0, preparation

prepn. in electrochem. conversion of anhyd. hydrogen chloride to chlorine gas using membrane-electrode assembly or gas diffusion electrodes

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129:205110

Burner exhaust gas collection assembly for a catalytic reformer.

Sterenber, David J. (Ballard Generation Systems Inc., Can.). U.S. US 5811065 A 22 Sep 1998, 9 pp. (English). (United States of America).

CODEN: USXXAM. CLASS: ICM: B01J008-06. NCL: 422198000.

APPLICATION: US 97-840027 24 Apr 1997. DOCUMENT TYPE:

Patent CA Section: 51 (Fossil Fuels, Derivatives, and Related Products) Section cross-reference(s): 52

A catalytic reformer includes a reformer vessel defining an interior plenum housing at least one reactor tube assembly having a catalyst bed. The reformer also includes a burner gas inlet for providing hot burner gas to heat the reactor tubes, and a burner gas outlet. A burner gas guide sleeve is disposed substantially coaxially around at least a portion of the reactor tube assembly, defining an annular burner gas passage. A burner exhaust gas collection assembly connects the burner gas guide sleeve to the burner gas outlet.

Keywords

catalytic reformer burner exhaust collection assembly

Index Entries

Reforming apparatus

steam; burner exhaust gas collection assembly for catalytic reformer

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129:141138

Assembly of solid catalysts.

De Jong, Krijn P. (Inorganic Chemistry Catalysis, Debye Institute, Utrecht University, Utrecht 3508, Neth.). CATTECH, 2(1), 87-95 (English) 1998 Baltzer Science Publishers. CODEN: CATTFB. ISSN: 1384-6566. DOCUMENT TYPE: Journal; General Review CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms) A review with 26 refs. In the first part of this century the prodn. of solid catalysts has started as the shaping of natural materials such as clays and bauxite. Next, the synthesis of solid catalysts aimed for the control of both chem. compn. and porous structure. The current and future developments involve the assembly of solid catalysts, viz. the control of the compn., structure and location of the active phases in three dimensions. I propose to refer to a catalyst thus fabricated as a catalytic device. The assembly at different length scales (mm,mm,nm) calls for new developments in (in)org. synthesis.

Keywords

assembly solid catalyst review

Index Entries

Catalysts

assembly of solid catalysts

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129:318648

Solid polymer type fuel cell and manufacture of assembly of solid polymer electrolyte membrane and electrodes for this cell. Uchida, Makoto; Fukuoka, Yuko; Sugawara, Yasushi; Eda, Nobuo (Matsushita Electric Industrial Co., Ltd., Japan). Eur. Pat. Appl. EP 874413 A2 28 Oct 1998, 12 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). (European Patent Organization). CODEN: EPXXDW. CLASS: ICM: H01M008-10. ICS: H01M004-88. APPLICATION: EP 98-107352 22 Apr 1998. PRIORITY: JP 97-104470 22 Apr 1997. DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 38 An electrode of solid polymer electrolyte fuel cells is produced by prepg. a mixed liq. contg. an org. solvent, a noble metal catalyst-supporting C powder, and a colloid of a solid polymer

electrolyte having a particle size of ≈ 1 and <400 nm, the colloid being adsorbed to the C powder, and by coating the mixed liq. on 1 side of a gas-diffusible layer. According to the invention, the solid polymer electrolyte is surely adsorbed to the surface of the catalyst and thus a wide reaction area can be secured. Also, thickness of the solid polymer electrolyte layer can be controlled to 1 in which H and O can be easily diffused.

Keywords

polymer electrolyte membrane electrode fuel cell

Index Entries

Fuel cell electrolytes
solid polymer type fuel cell and manuf. of assembly of electrodes and polymer membrane
Fuel cell electrodes
solid polymer type fuel cell and manuf. of assembly of solid polymer electrolyte membrane and
7440-06-4, uses
7440-44-0, uses
solid polymer type fuel cell and manuf. of assembly of solid polymer electrolyte membrane and electrodes

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129:204835

Mesoporous [M]-MSU-x metallo-silicate catalysts by non-ionic polyethylene oxide surfactant templating. Acid $[N0(N+)X-I-]$ and base $(NOM+I-)$ catalyzed pathways.

Bagshaw, Stephen A.; Kemmitt, Tim; Milestone, Neil B. (Advanced Materials Group, Industrial Research Limited, Lower Hutt, N. Z.).

Microporous Mesoporous Mater., 22(1-3), 419-433 (English) 1998

Elsevier Science B.V. CODEN: MIMMFJ. ISSN: 1387-1811.

DOCUMENT TYPE: Journal CA Section: 49 (Industrial Inorganic Chemicals) Section cross-reference(s): 46, 67

Solns. of low and high pH have been used to form non-ionically templated mesoporous metallo-silicates [M]-MSU-x materials; where $[M] = Al, Ti, V$ and Zr . Two new assembly routes are proposed which exploit the acid and base catalyzed hydrolysis and simultaneous condensation of metal oxo-salts and silicon tetraethoxide. Acid catalyzed hydrolysis, labeled $N0X-I+$ or $N+X-I+$ ($N0$ = nonyl-Ph polyethylene oxide, $X- = Cl-$ or $SO42-$, $I+ =$ protonated tetra-Et orthosilicate), produces well-defined materials with uniform pores in the small mesoporous region and moderate pore vols., but reduced metal incorporation owing to the high solubilities of metal cations in acidic solns. Base catalyzed hydrolysis, labeled $NOM+I-$ ($N0$ = nonyl-Ph polyethylene oxide, $M+ = Na+$ or $NH4+$, $I- =$ hydroxylated tetra-Et orthosilicate), also leads to materials with uniform channels in the small mesoporous region. Pore vols. and metal substitution are higher and framework shrinkage during calcination is reduced as a result of thicker pore walls. These new pathways show distinct similarities to those described by Attard for formations of hexagonally sym. silica from non-ionic surfactants under acidic conditions and also to mesoporous MCM-41 assembly routes via $(S+X-I+)$ anion mediated acid catalyzed assembly. The results demonstrate the feasibility of prepg. templated mesoporous metallo-silicates from non-ionic polyethylene oxide surfactants and metal oxy-hydroxy cationic precursors, but indicate that further optimization of the reaction conditions is required to maximize the potential of this synthesis approach.

Keywords

mesoporous metallosilicate catalyst prepn acid hydrolysis

base hydrolysis mesoporous metallosilicate catalyst prepn
polyethylene oxide surfactant metallosilicate catalyst prepn

Index Entries

Hydrolysis catalysts

base; mesoporous [M]-MSU-x metallo-silicate catalysts by
non-ionic polyethylene oxide surfactant templating and acid
[NO(N+)X-I-] and base (NOM+I-) catalyzed pathways

Acid hydrolysis

Acid hydrolysis catalysts

Base hydrolysis

Catalysts

Nonionic surfactants

Silicates, preparation

mesoporous [M]-MSU-x metallo-silicate catalysts by non-ionic
polyethylene oxide surfactant templating and acid
[NO(N+)X-I-] and base (NOM+I-) catalyzed pathways

7429-90-5, properties

7440-32-6, properties

7440-62-2, properties

7440-67-7, properties

9016-45-9

78-10-4

7699-43-6

10043-01-3

13825-74-6

27774-13-6

mesoporous [M]-MSU-x metallo-silicate catalysts by non-ionic
polyethylene oxide surfactant templating and acid
[NO(N+)X-I-] and base (NOM+I-) catalyzed pathways

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129:141135

Catalytic properties of mesoporous molecular sieves prepared by
neutral surfactant assembly.

Pinnavaia, Thomas J.; Zhang, Wenzhong (Department of Chemistry,
Center for Fundamental Materials Research, Michigan State University,
East Lansing, MI 48824, USA). Stud. Surf. Sci. Catal.,

117 (Mesoporous Molecular Sieves 1998), 23-36 (English) 1998

Elsevier Science B.V. CODEN: SSCTDM. ISSN: 0167-2991.

DOCUMENT TYPE: Journal; General Review CA Section: 67

(Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)

A review with 30 refs.; chem. modified derivs. of mesoporous HMS
mol. sieves silicas, prepd. by neutral surfactant assembly pathways,
have been used as catalysts for a variety of chem. conversions,
including peroxide oxidns. of olefins and phenols, ring opening polymn.
of lactide dimers, selective redn. of NOx, and cumene cracking. These
HMS catalysts are often more active than analogous catalysts prepd.
through electrostatic assembly mechanisms. The wormhole-like
framework mesopores, along with the presence of complementary
textural mesopores, most likely facilitate access to the catalytic active
centers in the framework.

Keywords

mesoporous mol sieve catalyst review

neutral surfactant assembly mol sieve review

Index Entries

Catalysts

Cracking catalysts

Molecular sieves

Oxidation catalysts
 Petroleum cracking catalysts
 Reduction catalysts
 Ring opening polymerization catalysts
 Surfactants
 Alkenes, reactions
 Phenols, reactions
 catalytic properties of mesoporous mol. sieves prepd. by neutral
 surfactant assembly

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128:153902

Self-assembly of several components into a highly enantioselective Ti catalyst for carbonyl-ene reactions.

Mikami, Koichi; Matsukawa, Satoru; Volk, Thorsten; Terada, Masahiro (Dep. Chemical Technol., Fac. Eng., Tokyo Inst. Technol., Tokyo 152, Japan). Angew. Chem., Int. Ed. Engl., Volume Date 1997, 36(24), 2768-2771 (English) 1998 Wiley-VCH Verlag GmbH. CODEN: ACIEAY. ISSN: 0570-0833. DOCUMENT TYPE: Journal CA Section: 25 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds) Mixts. of (R)-TADDOL or (R)-5-Cl-BIPOL [5,5'-dichloro-4,4',6,6'-tetramethyl-2,2'-biphenol] with (R)-BINOL and Ti(OCHMe₂)₄ formed chiral catalysts that gave enantiomeric excesses of 91 and 97% resp. in the reaction of PhCMe:CH₂ with HCOC₂Bu.

Keywords

catalyst chiral addn glyoxylate methylstyrene
 binaphthol tetraphenyldimethyldioxolanedimethanol titanium chiral
 catalyst addn

Index Entries

Addition reaction catalysts
 ene; enantioselective Ti catalyst for carbonyl-ene reactions
 188562-96-1
 202404-95-3
 98-83-9, reactions
 6295-06-3
 18531-94-7
 93379-48-7
 123436-17-9
 144121-63-1
 188348-50-7
 202404-97-5
 188562-87-0
 enantioselective Ti catalyst for carbonyl-ene reactions

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129:350097

Clusters as ligands. Large assemblies of transition metal clusters. Lei, Xinjian; Wolf, Eduardo E.; Fehlner, Thomas P. (Department Chemistry Biochemistry, University Notre Dame, Notre Dame, IN 46556, USA). Eur. J. Inorg. Chem., (12), 1835-1846 (English) 1998 Wiley-VCH Verlag GmbH. CODEN: EJICFO. ISSN: 1434-1948. DOCUMENT TYPE: Journal; General Review CA Section: 78 (Inorganic Chemicals and Reactions) Section cross-reference(s): 67 A review with 94 refs. A strategy of using functionalized clusters as ligands for cationic metal centers facilitates the construction of designed transition metal cluster assemblies. Examples of cluster metal carboxylates with conventional as well as novel structures are given and an application of these large mol. species to the generation of heterogeneous hydrogenation catalysts with unusual activities and

selectivities is described.

Keywords

review transition metal cluster assembly prepn
catalyst transition metal cluster array review

Index Entries

Transition metal compounds
cluster compds.; prepn. and application as catalyst precursors of
large assemblies of transition metal clusters
Catalysts
prepn. and application as catalyst precursors of large assemblies
of transition metal clusters
Cluster compounds
transition metal; prepn. and application as catalyst precursors of
large assemblies of transition metal clusters

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129:191443

Polymer electrolyte fuel cells.
Uchida, Makoto; Ohara, Hideo; Sugawara, Yasushi (Technol. Lab.,
Matsushita Battery Ind. Co., Ltd., Moriguchi, Japan). Matsushita Tech.
Rep., 44(4), 467-476 (Japanese) 1998 Matsushita Denki Sangyo K.K.,
Gijutsu Somu Senta, Gijutsu Johobu. CODEN: MTJOFJ. DOCUMENT
TYPE: Journal; General Review CA Section: 52 (Electrochemical,
Radiational, and Thermal Energy Technology) Section
cross-reference(s): 38
A review, with 15 refs., on new polymer electrolyte fuel cell (PEFC)
components. Anal. of microstructures of the electrodes and carbon
supports for the Pt catalyst indicates that distribution of the polymer
electrolyte in the catalyst layer and battery discharge characteristic are
greatly affected by structures of agglomerated C particles and
micropore structures in the primary particle surface. These results lead
to development of a new catalyst layer by optimizing the C support and
adsorbing the colloidal polymer electrolyte on the catalyst. A
self-humidified membrane-electrode assembly working at normal
temp. and pressure is developed by optimizing materials for the gas
diffusion layer and water-repelling conditions. A hybrid system
comprising a PEFC, Li-ion secondary battery and H storage tank with
H₂-absorbing alloy working at normal pressure are developed as a
compact, portable power source.

Keywords

review polymer electrolyte fuel cell

Index Entries

Fuel cell electrolytes
Fuel cells
Polymers, uses
polymer electrolyte fuel cells

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129:73243

Device for recombination of hydrogen in a gas mixture.
Eckardt, Bernd; Hill, Axel (Siemens A.-G., Germany). Ger. DE
19704608 C1 10 Jun 1998, 10 pp. (German). (Germany). CODEN:
GWXXAW. CLASS: ICM: G21C009-06. ICS: G21C019-317;
B01D053-86. APPLICATION: DE 97-19704608 7 Feb 1997.
DOCUMENT TYPE: Patent CA Section: 71 (Nuclear Technology)

Section cross-reference(s): 67

The device comprises a catalyst assembly housing in which the gas can flow freely by convection and the it has a flashback-preventing means. The flashback-preventing means is equipped with a sediment trap so that the catalyst particles do not fly around. The device can be used in nuclear reactors.

Keywords

hydrogen recombination catalyst assembly nuclear reactor

Index Entries

Nuclear reactors

Recombination catalysts

device for recombination of hydrogen in a gas mixt.

1333-74-0, reactions

device for recombination of hydrogen in a gas mixt.

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128:258189

Method of fabricating a cushion assembly.

Kelly, David J.; Haslanger, Paul (Foamex L.P.; Kelly, David J.;

Haslanger, Paul, USA). PCT Int. Appl. WO 9816142 A1 23 Apr 1998,

23 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG,

BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS,

JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK,

MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM,

TR, TT, UA, UG, US, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM;

RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA,

GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG.

(English). (World Intellectual Property Organization). CODEN: PIXXD2.

CLASS: ICM: A47C007-02. ICS: A47C027-15; B32B031-06;

B32B031-20; C09J005-06; C09J007-00. APPLICATION: WO

97-US18615 15 Oct 1997. PRIORITY: US 96-730969 16 Oct 1996.

DOCUMENT TYPE: Patent CA Section: 38 (Plastics Fabrication and

Uses)

A foam-fabric laminate and an air impervious adhesive film are placed over a mold; the adhesive is drawn against the foam and the fabric urged against the mold by vacuum. A foam pad is placed adjacent to the adhesive film, the film heated and diffused into the foam of the pad and the laminate and allowed to cure. The foam layer of the laminate is formed as the reaction product of a polyether polyol or a graft polyether polyol with ~30-60 parts of an MDI or polymeric MDI/TDI blended isocyanate or mixts. thereof, ~1.5-3.0 parts water as a blowing agent, ~0.05-0.90 parts amine catalyst, and ~0.5-1.5 parts silicone surfactant, wherein all amts. are based on 100 parts polyol.

Keywords

nylon automotive fabric foam laminate

polyamide fabric polyurethane foam laminate

seat cushion automobile foam laminate

Index Entries

Polyamides, uses

adhesives; method of fabricating cushion assembly of foam-fabric laminates for automobiles

Adhesive films

Automobile seat upholstery

Cushions

Laminated materials

Lamination

Polyamide fabrics
 Polyoxyalkylene-polyurethanes
 method of fabricating cushion assembly of foam-fabric laminates
 for automobiles
 172669-95-3
 method of fabricating cushion assembly of foam-fabric laminates
 for automobiles

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129:318412

Bulk crushing behavior of porous alumina particles under compressive loading.

Couroyer, C.; Ning, Z.; Bassam, F.; Ghadiri, M. (Dep. Chemical and Process Engineering, University Surrey, Surrey GU2 5XH, UK). World Congr. Part. Technol. 3, 598-609. Institution of Chemical Engineers: Rugby, UK. (English) 1998. CODEN: 66PSA9. DOCUMENT TYPE: Conference; (computer optical disk) CA Section: 51 (Fossil Fuels, Derivatives, and Related Products) Section cross-reference(s): 67 Catalyst carrier beads used in the oil industry experience different kind of breakage during their residence times in reactors. The behavior of the beads under compressive loading has been investigated to analyze and quantify this breakage. Single particle tests and bulk crushing test have been carried out to det. the material properties (Young's modulus, hardness, fracture toughness) and the individual and bulk crushing strengths of porous alumina beads. In order to correlate the single particle properties to the bulk behavior, the Bulk Crushing Strength (BCS) test was simulated using Distinct Element Anal. (DEA) and the exptl. particle properties input into the TRUBAL code. The simulation data are compared with the exptl. test. The breakage of the simulated assembly is found to be lower than the simulated one, particularly under low compressive loading, which leads to a lower BCS value. The reasons are investigated and could be due to the problem to measure material properties of porous spherical particles. Computer simulation results show that an increase in the value of Young's modulus and coeff. of friction input into the code leads to a significant increase of breakage in the assembly.

Keywords

alumina particle crushing

Index Entries

Catalyst supports
 Compressive strength
 Particles
 Petroleum refining catalysts
 Physicochemical simulation
 bulk crushing behavior of porous alumina particles under
 compressive loading
 1344-28-1, uses
 bulk crushing behavior of porous alumina particles under
 compressive loading

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129:190631

Preparation of binders from inexpensive byproducts for use in high-pressure phenolic laminates.

Ysbrandy, R. E.; Gerischer, G. F. R.; Sanderson, R. D. (Dept. of Wood Science, University of Stellenbosch, Stellenbosch, S. Afr.). Cellul. Chem. Technol., 32(1-2), 43-60 (English) 1998 Editura Academiei Romane. CODEN: CECTAH. ISSN: 0576-9787. DOCUMENT TYPE: Journal CA Section: 43 (Cellulose, Lignin, Paper, and Other Wood

Products) Section cross-reference(s): 38

Equal mixts. of phenosolvan pitch and autohydrolysis bagasse lignin in the presence of either acid or alk. catalyst and without catalyst were submitted to a thermal treatment stage at 230° (phenolation). Each of the phenolated products was blended with phenol resol (50:50 ratio) for impregnation of kraft paper and assembly of 10-ply high pressure laminates. Evaluation of their phys. performance indicated that these systems possessed high strength and stiffness. In this regard, the acid system behaved somewhat better than the alk. phenolated system, which in turn was better than the system without catalyst. These gains were however accompanied by a general loss in material toughness. These findings were similar to those obtained with a mixt. of phenol- and pitch resol and substantiated the use of either "modified pitch" via a formaldehyde pre-polymer stage or "modified pitch lignin" via heat treatment (phenolation) as "reactive extenders" for phenol impregnating varnish.

Keywords

phenosolvan pitch phenolation phenolic resin blend
phenolated hydrolysis lignin phenolic resin blend
binder phenolated lignin phenosolvan pitch

Index Entries

Binders

Kraft paper

Laminated materials

prepn. of binders from phenolated phenoslovan pitch and hydrolysis lignin and from pitch-formaldehyde resols for use in high-pressure kraft paper-phenolic laminates

Mechanical properties

Phenolic resins, uses

prepn. of binders from phenolic resin blends with phenolated phenoslovan pitch and hydrolysis lignin and from pitch-formaldehyde resols for use in high-pressure kraft paper-phenolic laminates

Phenolic resins, uses

prepn. of binders from phenolic resin blends with phenolated phenoslovan pitch and hydrolysis lignin for use in high-pressure kraft paper-phenolic laminates

100-97-0, uses

curing agents; prep. of binders from phenolic resin blends with phenolated phenoslovan pitch and hydrolysis lignin for use in high-pressure kraft paper-phenolic laminates

1310-73-2, uses

1333-39-7

phenolation catalysts; prep. of binders from phenolic resin blends with phenolated phenoslovan pitch and hydrolysis lignin for use in high-pressure kraft paper-phenolic laminates

8072-93-3, phenolated

37297-19-1, pitch, phenolated

prepn. of binders from phenolated phenoslovan pitch and hydrolysis lignin and from pitch-formaldehyde resols for use in high-pressure kraft paper-phenolic laminates

9003-35-4

50-00-0, reaction products with pitch

108-95-2, reaction products with phenosolvan pitch and hydrolysis lignin

prepn. of binders from phenolic resin blends with phenolated phenoslovan pitch and hydrolysis lignin for use in high-pressure kraft paper-phenolic laminates

129:183501

Use of hydrogen peroxide as analytical reagent in a continuous flow-assembly.

Bautista, J. A. Garcia; Mateo, J. V. Garcia; Catalyud, J. Martinez (Dep. Quim., Col. Univ. CEU, Moncada, Spain). J. Flow Injection Anal., 15(1), 61-66 (English) 1998 Nippon Bunseki Kagakkai Furo Injekushon Bunseki Kenkyu kondankai. CODEN: JFIAEA. ISSN: 0911-775X. DOCUMENT TYPE: Journal CA Section: 79 (Inorganic Analytical Chemistry)

A flow manifold is studied and proposed for the destruction of hydrogen peroxide after being used as oxidative reagent. The excess of reagent is destroyed and removed from the flow-injection manifold by means of a metallic copper reactor which acts as catalyst in the decompn. of H₂O₂.

Keywords

hydrogen peroxide continuous flow analysis

Index Entries

Flow analysis

use of hydrogen peroxide as anal. reagent in a continuous flow-assembly

7722-84-1, analysis

7440-50-8, uses

use of hydrogen peroxide as anal. reagent in a continuous flow-assembly

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128:63968

Method and apparatus for desulfurizing fuel gas to render it suitable for use in fuel-cell power plant.

Sederquist, Richard A.; Szydlowski, Donald F.; Corrigan, Thomas J.; Bonk, Stanley P.; Lesieur, Roger R. (International Fuel Cells Corporation, USA). PCT Int. Appl. WO 9745887 A1 4 Dec 1997, 19 pp. DESIGNATED STATES: W: CA, JP; RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: H01M008-06. ICS: B01D053-86; C01B003-48; C01B003-58.

APPLICATION: WO 97-US8822 27 May 1997. PRIORITY: US 96-656568 31 May 1996. DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 51

S and S compds. are removed from a gas stream, such as a hydrocarbon fuel gas stream in a hydrodesulfurizer assembly. Natural gas and recycled H enters the hydrodesulfurizer assembly at ~120°F. The gas stream heated to ~625°F enters a desulfurizing bed formed from a mixt. of Pt catalyst deposited on Al₂O₃ pellets and a pelletized ZnO H₂S absorbent. The gas is cooled to an exit temp. of ~525° as it passes through the desulfurizer bed. The desulfurizer bed is combined with a shift converter which decreases CO in the desulfurized gas stream after the latter passes through a steam-reformer bed.

Keywords

desulfurizing gas fuel cell power plant

hydrocarbon gas desulfurizing app fuel cell

platinum catalyst hydrocarbon gas desulfurizing

zinc oxide absorbent fuel gas desulfurizing

Index Entries

Apparatus

desulfurizing; for fuel gas to render it suitable for use in fuel-cell power plant
 Fuel cells
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 1314-13-2, uses
 absorbent in desulfurizing fuel gas to render it suitable for use in fuel-cell power plant
 7440-06-4, uses
 in desulfurizing fuel gas to render it suitable for use in fuel-cell power plant

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128:49157

Fluoropolymeric substrates with metalized surfaces and their manufacture.

Vargo, Terrence G.; Calvert, Jeffrey M.; Gardella, Joseph A., Jr.; Chen, Mu-san (Geo-Centers, Inc.; United States Dept. of the Navy, USA). U.S. US 5696207 A 9 Dec 1997, 9 pp. Cont. of U.S. Ser. No.354,857, abandoned. (English). (United States of America). CODEN: USXXAM. CLASS: ICM: C08F008-42. NCL: 525326200. APPLICATION: US 96-697933 3 Sep 1996. PRIORITY: US 94-354857 9 Dec 1994. DOCUMENT TYPE: Patent CA Section: 38 (Plastics Fabrication and Uses)

Fluoropolymer substrates with (selectively) metalized surfaces are prep. by (1) self-assembly of a chemisorbed layer of a metal ion-chelating organosilane coupling agent onto a fluoropolymer surface after radio frequency glow discharge plasma surface hydroxylation, (2) binding of a metalization catalyst, (3) and electroless deposition of metal species. The silane covalently binds an aq. Pd catalyst and subsequent electroless deposition yields homogeneous or patterned metal deposits that exhibit excellent adhesion to the fluoropolymer. Thus, FEP polymer (50 mil) was treated with H/MeOH plasma discharge, treated with a silane coupling agent, catalyzed with Na₂PdCl₄.3H₂O soln., and placed in an electroless plating bath contg. nickel soln. (Niposit 468) to provide the metalized fluoropolymer.

Keywords

metalized fluoropolymer
 organosilane coupling agent hydroxylated fluoropolymer
 electroless deposition metal catalyzed fluoropolymer
 nickel deposition catalyzed fluoropolymer

Index Entries

Electroless plating
 of metal on fluoropolymer substrates
 Glow discharge
 plasma; in hydroxylation of fluoropolymer substrates
 Coupling agents
 silane contg. catalyst-binding ligands for fluoropolymer;
 fluoropolymer substrates with metalized surfaces
 Fluoropolymers, processes
 Fluoropolymers, processes
 substrate; fluoropolymer substrates with metalized surfaces
 919-30-2
 1760-24-3
 27326-65-4
 coupling agent; fluoropolymer substrates with metalized surfaces
 13820-53-6
 78320-86-2
 fluoropolymer substrates with metalized surfaces
 7440-02-0, uses

7440-05-3, uses
7440-06-4, uses
7440-48-4, uses
7440-50-8, uses
7440-57-5, uses
52439-94-8

metalized film coating; fluoropolymer substrates with metalized surfaces

9002-84-0

24937-79-9

25067-11-2

substrate; fluoropolymer substrates with metalized surfaces

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129:247580

Measurements of proton conductivity in the active layer of PEM fuel cell gas diffusion electrodes.

Boyer, C.; Gamburzev, S.; Velez, O.; Srinivasan, S.; Appleby, A. J.

(Center Electrochemical Systems & Hydrogen Research, Texas

Engineering Experiment Station, Texas A and M Univ. System, College

Station, TX 77843-3402, USA). Electrochim. Acta, 43(24), 3703-3709

(English) 1998 Elsevier Science Ltd. CODEN: ELCAAV. ISSN:

0013-4686. DOCUMENT TYPE: Journal CA Section: 52

(Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 72, 76

This paper reports further studies to understand and optimize the Membrane and Electrode Assembly (MEA) structure in Polymer Electrolyte Membrane Fuel Cells (PEMFCs). The effective proton cond. in the active catalyst layer was measured as a function of its compn., which consisted of platinum catalyst on carbon support (E-Tek) and Nafion polymer electrolyte. The cond. was calcd. from the resistance added to a std. MEA by the addn. of an inactive composite layer in the electrolyte path between the anode and cathode. The specific cond. of the active layer was found to be proportional to the vol. fraction of Nafion in the composite mixt. Modeling studies showed that this ionic cond. limits the utilized active layer thickness to 20-25 mm.

Keywords

fuel cell gas diffusion electrode cond

proton cond gas diffusion cathode

Polymer Electrolyte Membrane Fuel Cell

Index Entries

Diffusion

Electric resistance

Fuel cell cathodes

Fuel cell electrolytes

Proton conductivity

Carbon black, uses

measurements of proton cond. in the active layer of PEM fuel cell

gas diffusion electrodes

7440-06-4, uses

163294-14-2

measurements of proton cond. in the active layer of PEM fuel cell

gas diffusion electrodes

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129:188873

Design of Bronsted Acid-Assisted Chiral Lewis Acid (BLA) Catalysts for Highly Enantioselective Diels-Alder Reactions.

Ishihara, Kazuaki; Kurihara, Hideki; Matsumoto, Masayuki; Yamamoto,

Hisashi (Research Center for Advanced Waste and Emission Management (ResCWE), Nagoya University, Nagoya 464-8603, Japan). J. Am. Chem. Soc., 120(28), 6920-6930 (English) 1998 American Chemical Society. CODEN: JACSAT. ISSN: 0002-7863. DOCUMENT TYPE: Journal CA Section: 21 (General Organic Chemistry)

Bronsted acid-assisted chiral Lewis acids (BLA) were highly effective as chiral catalysts for the enantioselective Diels-Alder reaction of both α -substituted and α -unsubstituted α,β -enals with various dienes. Hydroxy groups in optically active binaphthol derivs. and boron reagents with electron-withdrawing substituents were used as Bronsted acids and Lewis acids, resp. Intramol. Bronsted acids in a chiral BLA catalyst played an important role in accelerating the rate of Diels-Alder reactions and in producing a high level of enantioselectivity. In particular, excellent enantioselectivity was achieved due to intramol. hydrogen bonding and attractive p-p donor-acceptor interaction in the transition-state assembly by hydroxy arom. groups in a chiral BLA catalyst.

Keywords

asym Diels Alder Bronsted Lewis acid
binaphthol boron compds asym Diels Alder
aldehyde unsatd asym Diels Alder

Index Entries

Stereoselective Diels-Alder reaction catalysts
Lewis acids
Bronsted acids
Bronsted acid-assisted chiral Lewis acid catalysts for highly enantioselective Diels-Alder reactions
18531-94-7
75684-93-4
78-79-5, reactions
78-85-3
107-02-8, reactions
121-43-7
123-73-9
497-03-0
513-81-5
542-92-7, reactions
592-57-4
922-63-4
937-41-7
1576-87-0
2960-66-9
5720-06-9
6140-65-4
10294-33-4
14044-65-6
14371-10-9
14925-39-4
39939-07-6
50663-22-4
73852-19-4
75714-59-9
129026-20-6
149731-63-5
175671-31-5
211636-23-6
211734-45-1
211734-46-2
211734-47-3
211734-48-4

211734-49-5
 211734-52-0
 7560-64-7
 41894-54-6
 72203-35-1
 72203-36-2
 123483-12-5
 130932-54-6
 136559-32-5
 136577-69-0
 136838-50-1
 152377-87-2
 153380-53-1
 154194-42-0
 154194-43-1
 175476-70-7
 175476-71-8
 175476-72-9
 175476-73-0
 175476-74-1
 175476-75-2
 175671-38-2
 211636-21-4
 211636-24-7
 211636-25-8
 211734-44-0
 211734-50-8
 211734-51-9
 933-44-8
 18022-66-7
 40702-26-9
 72204-08-1
 151282-95-0
 152714-44-8
 175671-32-6
 175671-33-7
 211636-22-5
 211636-26-9

Bronsted acid-assisted chiral Lewis acid catalysts for highly enantioselective Diels-Alder reactions

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129:139906

Ensuring substrate retention. Part 2.

Kisenyi, J.; Soe, K.; Leason, P.; Tooby, C.; Pritchett, D.; Morgan, G.; Zillikens, M. (Ford Motor Co., USA). Stud. Surf. Sci. Catal., 116(Catalysis and Automotive Pollution Control IV), 513-526 (English) 1998 Elsevier Science B.V. CODEN: SSCTDM. ISSN: 0167-2991.

DOCUMENT TYPE: Journal CA Section: 59 (Air Pollution and Industrial Hygiene) Section cross-reference(s): 51, 67

To meet the European emission legislation limits at 80,000 km, the catalytic converter must have demonstrated thermal and mech. durability, as well as excellent catalytic conversion efficiencies. As engine performance increases and allowable tailpipe emission are reduced, the demand for thermal and mech. durability is even greater, esp. for European driving conditions. The system under discussion is a ceramic substrate mounted in the converter with an expanding (intumescent) support mat. The primary functions of the support mat are: to create the pressure that holds the substrate in position even when the metal can enclosure expands on heating, act as the gas-seal between the substrate and the can, and insulate the can from excessive temps. in the substrate,. Therefore, the ceramic monolithic support is an important part of the emission control system. The design has been very successful in the past; however, for some models a small no. of

substrates become loose after 25,000 to 30,000 mi in the field due to mat loss. Work was initiated to identify/eliminate the causes of mat loss and guarantee system durability. A range of design modifications have been investigated using the High Speed Dyno durability cycle. This paper is a fuller discussion of High Speed dyno durability cycle data for catalyst designs with two 169.67 ' 80.77 ' 63.09 mm substrates. The design modifications investigated fell into two categories: (1) mat mount d. such as increasing the mount d. from 4070 g/m² to 4300 g/m², and gradual redn. in the mat gap, and internal ribs; and (2) gas barrier concepts comprising a range of seals.. All these modifications resulted in mat loss. Controlling the can skin temp. to below 560° was the only method of getting the assembly to survive the High Speed Dyno test.

Keywords

exhaust gas converter support mat retention
catalyst exhaust converter support mat retention

Index Entries

Ceramics

exhaust gas catalytic converters contg.; ensuring substrate retention in exhaust gas catalytic converters

Three-way catalysts

exhaust gas; ensuring substrate retention in exhaust gas catalytic converters

Exhaust gas catalytic converters

three-way; ensuring substrate retention in exhaust gas catalytic converters

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128:182448

Development of small polymer electrolyte fuel cell stacks.

Paganin, V. A.; Ticianelli, E. A.; Gonzalez, E. R. (SP, 13560-970 Sao Carlos, CP 780, USP, Instituto de Quimica de Sao Carlos, Brazil). J. Power Sources, 70(1), 55-58 (English) 1998 Elsevier Science S.A.

CODEN: JPSODZ. ISSN: 0378-7753. DOCUMENT TYPE: Journal

CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology)

The results on the research and development of small polymer electrolyte fuel cell stacks, including the assembly of single cell, 6-cell and 21-cell modules, are described. The important characteristics of the systems are: (a) membrane and electrode assemblies were made with Nafion 115 and 117 membranes and particularly low catalyst loading electrodes presenting a geometric area of 20 cm² and a catalyst loading of 0.4 mg Pt/cm²; (b) bipolar plates were fabricated using a nonporous graphite material in which a series/parallel flow field was machined out; (c) external distribution of gases to the cells was done using parallel manifolding; (d) cooling systems were tested employing water/air cooling plates distributed every three cells throughout the stack; and (e) the reactant gases were externally humidified using temp. controlled humidification bottles. Testing of the stacks was conducted in a specially designed test station employing nonpressurized H₂/O₂ reactants and measuring the individual and the overall cell voltage vs. current under several conditions for the overall system operation.

Keywords

polymer electrolyte fuel cell stack development

Index Entries

Solid state fuel cells
development of small polymer electrolyte fuel cell stacks
66796-30-3
77950-55-1
development of small polymer electrolyte fuel cell stacks with
membrane of

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128:142332

Catalytic applications of mesoporous metallosilicate molecular sieves and methods for their preparation.

Pinnavaia, Thomas J.; Tanev, Peter T.; Zhang, Wenzhong; Wang, Jialiang; Chibwe, Malama (Board of Trustees Operating Michigan State University, USA). U.S. US 5712402 A 27 Jan 1998, 27 pp.
Cont.-in-part of U.S. Ser. No. 355,979. (English). (United States of America). CODEN: USXXAM. CLASS: ICM: C07C050-02. NCL: 552309000. APPLICATION: US 95-409173 23 Mar 1995. PRIORITY: US 94-293806 22 Aug 1994; US 94-355979 14 Dec 1994.
DOCUMENT TYPE: Patent CA Section: 45 (Industrial Organic Chemicals, Leather, Fats, and Waxes) Section cross-reference(s): 67
A neutral templating route to mesoporous mol. sieves based on H-bonding and self-assembly between neutral primary amine or diamine surfactants (S⁰) and neutral inorg. precursors (I⁰) is used to prep. hexagonal and lamellar mesoporous silicas with site isolated transition metal centers. This templating approach allows for the prepn. of hexagonal or hexagonal-like mesoporous oxidn. catalysts with large framework wall thickness of at least about 17 Å, small elementary particle size (≤400 Å), and unique combinations of framework-confined mesopores and textural mesopores while at the same time providing for facile recovery of the neutral template by simple solvent extn. These new mesoporous metallosilicate mol. sieves exhibit exceptional catalytic activity for peroxide hydroxylation of benzene and oxidn. of substituted aroms. with kinetic diams. that are too large (larger than 6 Å) to access the pore structure of the conventional microporous transition metal-substituted mol. sieves such as titano- and vanadosilicates.

Keywords

metallosilicate catalyst oxidn
mesoporous metallosilicate mol sieve catalyst

Index Entries

Tertiary amines

N-oxides; catalytic applications of mesoporous metallosilicate mol. sieves and methods for their prepn.

Hydroxylation catalysts

Oxidation catalysts

Peroxides, reactions

Peroxy acids

catalytic applications of mesoporous metallosilicate mol. sieves and methods for their prepn.

Molecular sieves

mesoporous metal silicate; catalytic applications of mesoporous metallosilicate mol. sieves and methods for their prepn.

Silicates, uses

metallo-, mesoporous mol. sieve; catalytic applications of mesoporous metallosilicate mol. sieves and methods for their prepn.

Quinones

mono- and binuclear; catalytic applications of mesoporous metallosilicate mol. sieves and methods for their prepn.

Amine oxides

tertiary; catalytic applications of mesoporous metallosilicate mol. sieves and methods for their prepn.
 78-10-4, reaction products with metal oxides
 1333-82-0, reaction products with tetra-Et orthosilicate
 13721-39-6, reaction products with tetra-Et orthosilicate
 159787-67-4
 71-43-2, reaction products with peroxides
 128-39-2, reaction products with peroxides
 57-09-0
 124-22-1
 2783-17-7
 75-91-2
 7722-84-1, reactions
 10102-44-0, reactions
 catalytic applications of mesoporous metallosilicate mol. sieves and methods for their prepn.

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128:123775

Amphiphilic peroxynitrite decomposition catalysts in liposomal assemblies.

Hunt, Julianne A.; Lee, Jinbo; Groves, John T. (Department of Chemistry, Princeton University, Princeton, NJ 08544, USA). Chem. Biol., 4(11), 845-858 (English) 1997 Current Biology Ltd. CODEN: CBOLE2. ISSN: 1074-5521. DOCUMENT TYPE: Journal CA Section: 1 (Pharmacology) Section cross-reference(s): 63
 Peroxynitrite (ONOO-), a toxic biol. oxidant, has been implicated in many pathophysiol. conditions. The water-sol. porphyrins 5,10,15,20-tetrakis(N-methyl-4'-pyridyl)porphinato iron(III) (FeTMPyP) and manganese(III) (MnTMPyP) have recently emerged as potential drugs for ONOO- detoxification, and FeTMPyP has demonstrated activity in models of ONOO- related disease states. We set out to develop amphiphilic analogs of FeTMPyP and MnTMPyP suitable for liposomal delivery in sterically stabilized liposomes (SLs). Three amphiphilic iron porphyrins (termed 1a-c) and three manganese porphyrins (termed 2a-c) bound to liposomes and catalyzed the decompn. of ONOO-. The polyethylene-glycol-linked metalloporphyrins 1b and 2b proved the most effective of these catalysts, rapidly decomp. ONOO- with second-order rate consts. (kcat) of $2.9 \times 10^5 \text{ M}^{-1} \text{ s}^{-1}$ and $5.0 \times 10^5 \text{ M}^{-1} \text{ s}^{-1}$, resp., in dimyristoylphosphatidylcholine liposomes. Catalysts 1b and 2b also bound to SLs, and these metalloporphyrin-SL constructs efficiently catalyzed ONOO- decompn. (kcat = $2 \times 10^5 \text{ M}^{-1} \text{ s}^{-1}$). The analogous metalloporphyrins 1a and 2a, which are not sepd. from the vesicle membrane surface by polyethylene glycol linkers, were significantly less effective (kcat = $3.5 \times 10^4 \text{ M}^{-1} \text{ s}^{-1}$). For these amphiphilic analogs of FeTMPyP and MnTMPyP, the polarity of the environment of the metalloporphyrin headgroup is intimately related to the efficiency of the catalyst; a polar aq. environment is essential for effective catalysis of ONOO- decompn. Thus, catalysts 1b and 2b react rapidly with ONOO- and are potential therapeutic agents that, unlike their water-sol. TMPyP analogs, could be administered as liposomal formulations in SLs. These SL-bound amphiphilic metalloporphyrins may prove to be highly effective in the exploration and treatment of ONOO- related disease states.

Keywords

amphiphilic peroxynitrite decompn catalyst liposome assembly

Index Entries

Antioxidants (pharmaceutical)
 Liposomes (drug delivery systems)
 amphiphilic peroxynitrite decompn. catalysts in liposomal

assemblies
 Decomposition catalysts
 amphiphilic; amphiphilic peroxyxynitrite decompn. catalysts in
 liposomal assemblies
 19059-14-4
 201994-82-3
 201994-84-5
 201994-86-7
 201994-88-9
 201994-90-3
 201994-92-5
 112-50-5
 4292-19-7
 4403-58-1
 16834-13-2
 126750-26-3
 149270-96-2
 201994-94-7
 201994-97-0
 201994-99-2
 amphiphilic peroxyxynitrite decompn. catalysts in liposomal
 assemblies

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128:115314

Water Soluble Photo- and Electroluminescent Alkoxy-Sulfonated
 Poly(p-phenylenes) Synthesized via Palladium Catalysis.
 Kim, Seunggho; Jackiw, Jennifer; Robinson, Edward; Schanze, Kirk S.;
 Reynolds, John R.; Baur, Jeff; Rubner, Michael F.; Boils, Danielle
 (Department of Chemistry Center for Macromolecular Science and
 Engineering, University of Florida, Gainesville, FL 32611, USA).
 Macromolecules, 31(4), 964-974 (English) 1998 American Chemical
 Society. CODEN: MAMOBX. ISSN: 0024-9297. DOCUMENT TYPE:
 Journal CA Section: 35 (Chemistry of Synthetic High Polymers) Section
 cross-reference(s): 73
 Water-sol. poly(p-phenylene) derivs.,
 poly[2,5-bis(3-sulfonatopropoxy)-1,4-phenylene-alt-1,4-phenylene]
 sodium salt (PPP-OPSO3) and
 poly[2,5-bis(3-sulfonatopropoxy)-1,4-phenylene-alt-4,4'-biphenylene]
 sodium salt (PPBP-OPSO3), were synthesized through a Suzuki
 coupling reaction of 1,4-dibromo-2,5-bis(3-sulfonatopropoxy)benzene
 sodium salt with 1,4-phenylenediboronic acid or
 4,4'-biphenyldiylidiboronic acid 2,2'-dimethylpropyl diester using a
 water-sol. Pd(0) catalyst or Pd(OAc)2. The pH dependence of the
 coupling reaction was investigated and resulted in pH independence at
 pH levels greater than 10.0. End group anal. of PPP-OPSO3 via 1H
 NMR of tert-Bu end-capped polymers indicates d.p. in excess of 40
 (ca. 80 rings per chain). Viscometric anal. of PPP-OPSO3 in water
 shows a behavior comparable to sodium poly(styrenesulfonate) (PSS)
 of mol. wt. 8000. In addn., the polyelectrolyte effect is obsd. at low
 polymer concns. The lmax of the p ð p* absorption for PPP-OPSO3 is
 found at 339-342 nm, while that of PPBP-OPSO3 shows a
 bathochromic shift to 349-352 nm. All of the water-sol. PPP oligomers
 and polymers feature strong blue fluorescence. The fluorescence has
 been characterized by quantum yield and lifetime studies.
 Nanosecond-microsecond laser flash photolysis expts. indicate that
 direct excitation of the polymers in the near-UV leads to triplet state
 formation, albeit with comparatively low efficiency. Multilayered films of
 PPP-OPSO3 were fabricated with poly(ethyleneimine) (PEI) using
 layer-by-layer self-assembly and incorporated into blue-light-emitting
 devices.

Keywords

alkoxy sulfonated polyphenylene prepn palladium catalyst
 photoluminescence alkoxy sulfonated polyphenylene
 electroluminescence alkoxy sulfonated polyphenylene
 LED polyphenyleneimine polyphenylene

Index Entries

Polyamines (polymeric)
 blue LED prepd. from alkoxy-sulfonated polyphenylenes and
 poly(ethyleneimine)
 Electroluminescent devices
 blue-emitting; blue LED prepd. from alkoxy-sulfonated
 polyphenylenes and poly(ethyleneimine)
 Electroluminescence
 Fluorescence
 Luminescence
 UV and visible spectra
 Polyphenyls
 prepn. of water-sol. photo- and electroluminescent
 alkoxy-sulfonated poly(p-phenylenes)
 9002-98-6
 blue LED prepd. from alkoxy-sulfonated polyphenylenes and
 poly(ethyleneimine)
 126-30-7
 esterification with biphenyldiylidiboronic acid
 4151-80-8
 esterification with dimethylpropanediol
 150-78-7
 1120-71-4
 in prepn. of dibromobis(sulfonatopropoxy)benzene monomer
 153912-34-6
 model compd. for alkoxy-sulfonated polyphenylenes
 123324-71-0, reaction products with alkoxy-sulfonated polyphenylenes
 174697-31-5, reaction products with (tert-butylphenyl)boronic acid
 201605-68-7
 123324-71-0
 prepn. and characterization of
 5487-93-4
 153912-33-5
 prepn. and polymn. of
 174721-53-0
 201605-64-3
 153986-30-2
 174697-31-5
 prepn. of water-sol. photo- and electroluminescent
 121-43-7
 reaction with (tert-butylphenyl)magnesium bromide
 98-80-6
 reaction with dibromobis(sulfonatopropoxy)benzene
 63488-10-8
 reaction with tri-Me borate

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128:91047
 Ion exchange membrane fuel-cell power plant with water management
 pressure differentials.
 Reiser, Carl (International Fuel Cells Corp.; USA). U.S. US 5700595 A
 23 Dec 1997, 7 pp. (English). (United States of America). CODEN:
 USXXAM. CLASS: ICM: H01M008-00. NCL: 429013000.
 APPLICATION: US 95-494132 23 Jun 1995. DOCUMENT TYPE:
 Patent CA Section: 52 (Electrochemical, Radiational, and Thermal
 Energy Technology)
 A proton exchange membrane fuel-cell device with an internal water
 management and transfer system includes a plurality of adjacently

arranged proton-exchange membrane assemblies including a proton-exchange membrane component; a pair of porous anode and cathode catalyst layers situated on either side of the proton-exchange membrane; and porous plate assemblies interposed between and in contact with each of the adjacent proton-exchange membrane assemblies. Oxidant gas is supplied to oxidant-gas supply channels, and fuel gas to fuel-gas supply channels formed in the porous plate assemblies for distribution to the cathode and anode catalyst layers, resp. A water-coolant circulating system is formed in each of the porous plate assemblies and causes each of the porous plate assemblies to become satd. with coolant water. The reactant flow fields are pressurized to a pressure which exceeds the coolant-water circulating pressure by a selected pressure difference so as to ensure that product H₂O formed on the cathode side of each membrane assembly will be pumped through the porous plates into the coolant-water flow field and become entrained in the circulating coolant-water stream.

Keywords

ion exchange membrane fuel cell power
power plant fuel cell

Index Entries

Ion exchange membranes
fuel-cell power plant with water management pressure differentials
Fuel cells
ion exchange membrane fuel-cell power plant with water
management pressure differentials

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129:276987

Recent advances in the use of molecularly imprinted materials in separation and synthesis.

Ramstrom, Olof; Ye, Lei; Gustavsson, Per-Erik (Department of Pure and Applied Biochemistry, Center for Chemistry and Chemical Engineering, Lund University, Lund S-221 00, Swed.). ACS Symp. Ser., 703 (Molecular and Ionic Recognition with Imprinted Polymers), 82-89 (English) 1998 American Chemical Society. CODEN: ACSMC8. ISSN: 0097-6156. DOCUMENT TYPE: Journal; General Review CA Section: 38 (Plastics Fabrication and Uses)

Recent advances in the use of molecularly imprinted polymers in recognition and sepn. applications are reviewed with 17 refs. Molecularly imprinted materials, prepd. using self-assembly imprinting protocols using only non-covalent interactions, can be used as chromatog. media in aq. phase. The recognition properties are highly dependent on the interacting species used in the imprinting protocol. Ionic interactions, together with strong hydrogen bonding, represent useful means of obtaining recognition. With increasing levels of water in the recognition media, the hydrophobic effect comes into play. Molecularly imprinted materials can furthermore be used as auxiliary agents in enzymic syntheses in water-satd. org. phases. When materials molecularly imprinted for the reaction product were used in the thermolysin-catalyzed aspartame synthesis, an increase in yield was obsd. Introduction of a thermodyn. trap provided by the molecularly imprinted matrixes allowed a non-favorable equil. for the thermolysin reaction to be pushed in the forward direction.

Keywords

mol imprinted polymer application review

Index Entries

Chromatographs

columns; recent advances in use of molecularly imprinted polymers in sepn. and synthesis

Polymers, miscellaneous

molecularly imprinted; recent advances in use of molecularly imprinted polymers in sepn. and synthesis

Organic synthesis

recent advances in use of molecularly imprinted polymers in sepn. and synthesis

9073-78-3

catalyst; recent advances in use of molecularly imprinted polymers in thermolysis-catalyzed aspartame synthesis

22839-47-0

recent advances in use of molecularly imprinted polymers in thermolysis-catalyzed aspartame synthesis

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129:269338

SAXS and WAXD study of the mesostructure of molybdenum oxide formed by a block copolymer matrix.

Xie, Yi; Liu, Tianbo; Liu, Li-zhi; Chu, Benjamin (Dep. Chem., State Univ. New York, Stony Brook, NY 11794-3400, USA). Polym. Mater. Sci. Eng., 79, 334-335 (English) 1998 American Chemical Society.

CODEN: PMSEGD. ISSN: 0743-0515. DOCUMENT TYPE: Journal

CA Section: 78 (Inorganic Chemicals and Reactions) Section cross-reference(s): 67, 74

Closed-assocd. micelles with core-shell structures can be formed by taking advantage of the self-assembly behavior of the amphiphilic block copolymer in selective solvents. The macroscopic unit cells in the ordered micelles can be used as good matrixes for synthesis of inorg. compds. with nanoscale modification. A com. triblock copolymer E45B14E45, where E = poly(oxyethylene) and B = poly(oxybutylene) units, was used as a template for formation of a modified MoO₃ mesophase consisting of MoO₃ powders with ordered arrays of holes (former micellar cores, with an av. size of 5.7 nm). Characterization by SAXS and WAXD (small-angle x-ray scattering and wide-angle x-ray diffraction resp.) of the product after removal of the polymer matrix revealed that the formation of MoO₃ with an ordered structure. The ordered nanopores in the modified MoO₃ powder with superlattice structure would make the new materials useful as an absorbent, photocatalyst, a selective reaction medium, or a catalyst carrier.

Keywords

mesostructure molybdenum oxide block copolymer matrix

Index Entries

Mesophase

Micelles

Pore

Block polymers

formation of modified MoO₃ mesophase consisting of MoO₃ powders with ordered arrays of holes using triblock copolymer template

Absorbents

Catalysts

Photochemical catalysts

Polyoxyalkylenes, properties

formation of modified MoO₃ mesophase consisting of MoO₃ powders with ordered arrays of holes using triblock copolymer template in relation to

X-ray scattering

small angle; formation of modified MoO₃ mesophase consisting of MoO₃ powders with ordered arrays of holes using triblock copolymer template in relation to X-ray diffraction
 wide-angle; formation of modified MoO₃ mesophase consisting of MoO₃ powders with ordered arrays of holes using triblock copolymer template in relation to
 1313-27-5, preparation
 formation of modified MoO₃ mesophase consisting of MoO₃ powders with ordered arrays of holes using triblock copolymer template
 139323-06-1
 108084-31-7
 formation of modified MoO₃ mesophase consisting of MoO₃ powders with ordered arrays of holes using triblock copolymer template in relation to

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129:245338

Metal-assisted stacking interactions and the facilitated hydrolysis of nucleoside 5'-triphosphates.

Sigel, Helmut (Institute Inorganic Chem., Univ. Basel, Basel CH-4056, Switz.). Pure Appl. Chem., 70(4), 969-976 (English) 1998 Blackwell Science Ltd. CODEN: PACHAS. ISSN: 0033-4545. DOCUMENT

TYPE: Journal; General Review CA Section: 33 (Carbohydrates)

A review with 43 refs. The self-assocn. properties of the common nucleosides and nucleotides are summarized; if defined via their nucleobases they decrease in the order, adenine > guanine > hypoxanthine > cytosine > uracil. Next, some aspects of the metal ion-promoted dephosphorylation of nucleoside 5'-triphosphates (NTPs) are reviewed. It is shown that the dephosphorylation rate in the presence of Cu²⁺ decreases in the series, ATP > GTP > ITP > pyrimidine-NTPs. Similarly, addn. of AMP, GMP or IMP (decreasing order of effectiveness) to a Cu²⁺/ATP system facilitates the dephosphorylation reaction further because one of the two ATPs in the stacked reactive intermediate, occurring in low concn., [Cu₂(ATP)]₂(OH)⁻, has a structural role and this 'enzyme-like' ATP₄⁻ can be replaced by one of the mentioned nucleoside 5'-monophosphates. These results demonstrate how weak interactions, i.e. arom.-ring stacking, can govern the reactivity of a system. Next to stacking, the purine(N7)-metal ion interaction allowing bridging and stabilization of the stack by inclusion of the phosphate group(s) is important; therefore, addn. of tubercidin 5'-monophosphate (= 7-deaza-AMP₂⁻) to Cu²⁺/ATP inhibits the reactivity of the system. The structural delicacy of the reactive intermediate is further emphasized by the inhibiting effects of 1,N⁶-ethenoadenosine 5'-monophosphate (e-AMP₂⁻) and AMP N(1)-oxide; in contrast, the dianion of the antiviral 9-[2-(phosphonomethoxy)ethyl]adenine (PMEA₂⁻) mimics AMP₂⁻ exceedingly well and facilitates even further the Cu²⁺-promoted dephosphorylation of ATP.

Keywords

metal catalyzed hydrolysis nucleoside triphosphate review
 dephosphorylation copper catalyst review

Index Entries

Hydrolysis catalysts
 metal ions (copper and cadmium); metal-assisted stacking interactions and copper-facilitated hydrolysis of nucleoside 5'-triphosphates
 Cations
 Hydrolysis kinetics

Phosphorylation-dephosphorylation
Self-assembly
Deoxyribonucleoside triphosphates
Nucleoside triphosphates
metal-assisted stacking interactions and copper-facilitated
hydrolysis of nucleoside 5'-triphosphates

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129:216465

Heterocycles via Pd catalyzed molecular queuing processes. Relay switches and the maximization of molecular complexity.

Grigg, Ronald; Sridharan, Visuvanathar (Molecular Innovation, Leeds University, Leeds LS2 9JT, UK). Pure Appl. Chem., 70(5), 1047-1057 (English) 1998 Blackwell Science Ltd. CODEN: PACHAS. ISSN: 0033-4545. DOCUMENT TYPE: Journal; General Review CA Section: 27 (Heterocyclic Compounds (One Hetero Atom)) Section

cross-reference(s): 28

A review with 21 refs. Pd(0) catalysts facilitate the assembly of complex heterocycles and carbocycles contg. 3-7 membered rings from a range of simple building blocks (allenes, carbon monoxide, alkenes, organometallic complexes of B, Zn, Sn, etc.). These cascade processes display remarkable chemo-, regio- and stereoselectivity and considerably extend the scope and utility of our previously developed cyclization-anion capture cascades. The success of these processes is critically dependent on the relative rates of a range of potentially competing processes and the various substrates can be regarded as queuing for access to the catalytic metal center. Certain compds. are identified as relay switches because they extend the relay phase of the cyclization-anion capture cascade while allowing the Pd catalyzed cascades to switch between inter- and intra-mol. processes.

Keywords

heterocycle prepn review
palladium catalyst heterocycle prepn review

Index Entries

Heterocyclic compounds
prepn. of heterocycles via Pd catalyzed mol. queuing processes
7440-05-3, uses
prepn. of heterocycles via Pd catalyzed mol. queuing processes

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129:119161

IHF modulation of Tn10 transposition: sensory transduction of supercoiling status via a proposed protein/DNA molecular spring. Chalmers, Ronald; Guhathakurta, Anjan; Benjamin, Howard; Kleckner, Nancy (Department of Molecular and Cellular Biology, Harvard University, Cambridge, MA 02138, USA). Cell (Cambridge, Mass.), 93(5), 897-908 (English) 1998 Cell Press. CODEN: CELLB5. ISSN: 0092-8674. DOCUMENT TYPE: Journal CA Section: 6 (General Biochemistry)

Architectural protein IHF modulates Tn10 transposition in vitro. IHF stimulates transposon excision. Also, sep., IHF forces transposon end/target DNA interactions into a constrained pathway, "channeling," that yields only unknotted intratransposon inversion circles. Neg. supercoiling influences both effects, differently. We infer that IHF is an architectural catalyst: it promotes initial transpososome assembly and is then ejected from the transpososome. IHF then rebinds, altering transpososome conformation to promote channeling. We also infer that the developing transpososome is a mol. spring: DNA provides basic elasticity; a conformational change in transposase provides

force; and IHF and/or supercoiling provide conformational inputs. In vivo, IHF is a sensory transducer of chromosomal supercoiling status: with supercoiling absent, IHF is "supercoiling relief factor"; with supercoiling present, stimulation and channeling comprise a homeostatic pair such that modest changes in chromosome condition strongly influence transpositional outcome.

Keywords

IHF Tn10 transposition DNA signal transduction

Index Entries

Conformation (protein)
Signal transduction (biological)
Transposition (genetic)
IHF (integration host factor)
DNA
IHF modulation of Tn10 transposition and sensory transduction of supercoiling status via a proposed protein/DNA mol. spring
Proteins (specific proteins and subclasses)
Tn10; IHF modulation of Tn10 transposition and sensory transduction of supercoiling status via a proposed protein/DNA mol. spring

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129:69689

Overgrowth of mesoporous MCM-41 on zeolite ZSM-5.

Li, Fuxiang; Wu, Lan; Qin, Manggeng; Dou, Tao; Zhong, Bing (Res. Inst. Spec. Chem., Taiyuan Univ. Sci. Technol., Taiyuan, Peop. Rep. China).

Ranliao Huaxue Xuebao, 26(2), 102-107 (Chinese) 1998 Kexue

Chubanshe. CODEN: RHXUD8. ISSN: 0253-2409. DOCUMENT

TYPE: Journal CA Section: 51 (Fossil Fuels, Derivatives, and Related Products) Section cross-reference(s): 67

A new zeolite ZSM-5 overgrown with a thin layer of mesoporous MCM-41 has been prepd. The synthesized samples were characterized by XRD, TEM and N₂ adsorption isothermal. The products had bimodal pore size distribution and the mesoporous MCM-41 overgrew on ZSM-5 indeed. The F- which existed on the surface of the zeolite ZSM-5 stimulated the overgrowth of MCM-41. A new form (X-S+I-) has been put forward for the first time, which supplemented the electrostatic assembly theory. In addn., the synthesis chem. during the overgrowing of MCM-41 on the surface of zeolite ZSM-5 has also been studied.

Keywords

catalyst ZSM5 zeolite MCM41 overgrowth

Index Entries

Catalysts
Zeolite MCM-41
Zeolite ZSM-5
overgrowth of mesoporous MCM-41 on zeolite ZSM-5

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129:65797

Protein folding in the secretory pathway of animal cells.

Freedman, Robert B.; Greenall, Carole; Jenkins, Nigel; Tuite, Mick F. (Research School of Biosciences, Biological Laboratory, University of Kent, Kent CT2 7NJ, UK). Cytotechnology, 18(1/2), 77-82 (English)

1995 Kluwer Academic Publishers. CODEN: CYTOER. ISSN:

0920-9069. DOCUMENT TYPE: Journal; General Review CA Section:
13 (Mammalian Biochemistry)

A review with 12 refs. The exit of newly-synthesized proteins from the lumen of the endoplasmic reticulum (ER) is the rate-detg. step in protein secretion. Only correctly-folded and fully-assembled proteins exit the ER and progress along the secretory pathway. Folding and assembly in the ER are mediated by a variety of factors including folding catalysts and mol. chaperones. The properties of these factors, and the nature of their interactions with folding substrates, are beginning to be clarified. Little work has been done to characterize these processes and these factors in cell lines employed for large-scale cell culture. Manipulation of these process may permit improvement in yield or productivity of recombinant proteins by cultured animal cells.

Keywords

review protein folding secretion endoplasmic reticulum
folding catalyst chaperone protein secretion review
disulfide bond posttranslation protein folding review

Index Entries

Disulfide bond
Endoplasmic reticulum
Post-translational processing
Protein folding
Protein secretion
Chaperonins
protein folding in secretory pathway of animal cells
37318-49-3
95076-93-0
protein folding in secretory pathway of animal cells

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129:45376

Spectrofluorimetric determination of iproniazid and isoniazid in a FIA system provided with a solid-phase reactor.

Bautista, J. A. Garcia; Mateo, J. V. Garcia; Calatayud, J. Martinez (Departamento de Quimica, Colegio Universitario CEU, Moncada, Valencia, Spain). Anal. Lett., 31(7), 1209-1218 (English) 1998 Marcel Dekker, Inc. CODEN: ANALBP. ISSN: 0003-2719. DOCUMENT TYPE: Journal CA Section: 64 (Pharmaceutical Analysis)

A single-channel flow-injection anal. (FIA) assembly is proposed for the fluorimetric detn. of iproniazid and isoniazid. The oxidn. of both drugs was carried out by H₂O₂. The excess of reagent was destroyed and removed from the flow-injection manifold by a metallic copper reactor which acted as a catalyst in the decompn. of H₂O₂ and a degaser. The calibration graphs were linear up to 14 mg iproniazid/mL and 10 mg isoniazid/mL and the resp. limits of detection were 0.008 and 0.005 mg/mL. The sample throughput was 24 h⁻¹ for both drugs. The influence of interfering compds. was evaluated and the procedure was applied to the detn. of iproniazid and isoniazid in pharmaceutical formulations.

Keywords

iproniazid isoniazid flow injection pharmaceutical spectrofluorimetry

Index Entries

Flow injection analysis
Fluorometry
Pharmaceutical analysis

iproniazid and isoniazid detn. in pharmaceutical preps. by
 flow-injection spectrofluorimetry with solid-phase copper
 reactor
 54-85-3
 54-92-2
 iproniazid and isoniazid detn. in pharmaceutical preps. by
 flow-injection spectrofluorimetry with solid-phase copper
 reactor

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128:308042

Palladium catalyzed reactions of allenes, carbon monoxide, and
 nucleophiles.

Grigg, Ronald; Monteith, Michael; Sridharan, Visuvanathar; Terrier,
 Catherine (School of Chemistry, Leeds University, Leeds HD2 1FF,
 UK). Tetrahedron, 54(15), 3885-3894 (English) 1998 Elsevier Science
 Ltd. CODEN: TETRAB. ISSN: 0040-4020. DOCUMENT TYPE:

Journal CA Section: 21 (General Organic Chemistry)

Hydridopalladium(II) species generated in situ by oxidative addn. of
 Pd(0) to acetic acid or acidic hydroxyl substrates (phenols, oximes)
 catalyze the termol. assembly of allenes, CO and amines (primary,
 secondary) or oxygen nucleophiles to give methacrylamides or
 methacrylate esters and derivs. thereof in good to excellent yield.

Keywords

palladium catalyst allene carbon monoxide nucleophile
 methacrylamide prepn
 methacrylate prepn

Index Entries

Allenes

Nucleophiles

palladium catalyzed reactions of allenes, carbon monoxide, and
 nucleophiles

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90-15-3

91-21-4

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100-64-1

106-44-5, reactions

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110-89-4, reactions

120-72-9, reactions

123-30-8

123-75-1, reactions

124-40-3, reactions

127-06-0

463-49-0

554-84-7

630-08-0, reactions

1953-54-4

2327-99-3

2627-86-3

39876-39-6

56956-46-8

205991-38-4

2177-70-0
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 6976-91-6
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 13886-05-0
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 16522-40-0
 16522-41-1
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 19243-95-9
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 69067-86-3
 74937-80-7
 77302-25-1
 86015-25-0
 86229-45-0
 205991-39-5
 205991-40-8
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 205991-43-1
 205991-45-3
 palladium catalyzed reactions of allenes, carbon monoxide, and
 nucleophiles

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128:257187
 Nickel-Catalyzed Diastereodifferentiative Tandem Coupling of
 a,b-Enones, Norbornenes, and Organometallics.
 Cui, Dong-Mei; Yamamoto, Hiroaki; Ikeda, Shin-ichi; Hatano, Keiichiro;
 Sato, Yoshiro (Faculty of Pharmaceutical Sciences, Nagoya City
 University, Nagoya 467, Japan). J. Org. Chem., 63(8), 2782-2784
 (English) 1998 American Chemical Society. CODEN: JOCEAH.
 ISSN: 0022-3263. DOCUMENT TYPE: Journal CA Section: 24
 (Alicyclic Compounds)
 The tandem reaction of norbornenes with enones, alkynyltin, and
 (chlorotrimethyl)silane gave the diastereoselective coupling products
 (up to >98% de) in the presence of a nickel catalyst. The present
 reaction has the potential to create new contiguous chiral carbon
 centers by causing mutual recognition between the enantiotopic face of
 the enone and the enantiotopic position of norbornene in a one-pot
 assembly.

Keywords

nickel diastereodifferentiative coupling cycloalkenone norbornene
 organometallic
 stannane alkynyl diastereodifferentiative coupling cycloalkenone
 norbornene
 chiral carbon centers contiguous prepn

Index Entries

Coupling reaction
 Coupling reaction catalysts
 stereoselective; nickel-catalyzed diastereodifferentiative tandem
 coupling of cycloalkenones, norbornenes, and
 organometallics
 110-86-1, uses
 1191-15-7

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75-77-4, reactions
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205052-09-1
205052-10-4
205238-08-0

nickel-catalyzed diastereodifferentiative tandem coupling of cycloalkenones, norbornenes, and organometallics

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128:246150

Method for hydrocarbon steam reforming.

Kato, Hajime (Kato, Hajime, Japan). PCT Int. Appl. WO 9814536 A1 9 Apr 1998, 50 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (Japanese). (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: C10G035-04.

APPLICATION: WO 97-JP3494.1 Oct 1997. PRIORITY: JP 96-262945

3 Oct 1996; JP 97-149407 6 Jun 1997. DOCUMENT TYPE: Patent

CA Section: 51 (Fossil Fuels, Derivatives, and Related Products)

Section cross-reference(s): 45, 49

A steam reforming system is described which uses a primary reforming app. including an external-combustion reforming furnace to generate a primary reforming reaction gas of mixed gas of hydrocarbons and steam and a secondary reforming app. which is an internal-combustion reforming app. to cause the secondary reforming reaction of the primary reforming gas obtained by the primary reforming step to progress in the presence of air and/or oxygen. A burner assembly of the external-combustion reforming furnace has a plurality of burners which heat catalyst pipes and a plurality of heat-storage units which preheat the combustion air flows fed to the burners. The flue gas of the external-combustion reforming furnace heats 2nd heat-storage units which preheat combustion air flows fed to 2nd burners while the 1st burners are burning, and preheats the 1st heat-storage units which preheat the combustion air flows fed to the 1st burners while the 2nd burners are burning. The flow passage of the flue gas is controlled to be selectively switched to a 1st low passage or a 2nd flow passage. The fluid of 10-30 wt.% of the flue gas of the external-combustion reforming furnace is supplied to 1st and 2nd heat exchangers from the intra-furnace region of the external-combustion reforming furnace, and raw material hydrocarbon or hydrocarbon/steam mixed gas and air and/or oxygen are heated by heat exchange action of the heat exchangers. Reforming gas generated in the system is supplied to a 3rd heat exchanger heats the hydrocarbon/steam mixed gas in the heat exchanger, and is sent out into a reformed gas delivery line. The steam reforming system as described above can achieve a high and economical energy efficiency or a manufg. efficiency of the whole plant.

Keywords

steam reforming hydrocarbon synthesis gas manufg

Index Entries

Steam reforming fuel gas manufacturing
 app.; method for steam reforming of hydrocarbons for synthesis
 gas manuf.
 Steam reforming fuel gas manufacturing
 Synthesis gas manufacturing
 steam reforming synthesis gas manufg.; method for hydrocarbon
 steam reforming
 Reforming apparatus
 steam; method for steam reforming of hydrocarbons for synthesis
 gas manuf.
 1333-74-0, preparation
 manuf.; method for hydrocarbon steam reforming for
 74-82-8, reactions
 method for steam reforming of hydrocarbons contg.
 124-38-9, preparation
 630-08-0, preparation
 method for steam reforming of hydrocarbons to synthesis gas
 contg.
 67-56-1, preparation
 7664-41-7, preparation
 synthesis; method for hydrocarbon steam reforming for

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128:206767

Performance and endurance of a PEMFC operated with synthetic
 reformat fuel feed.

Sishtla, Chakravarthy; Koncar, Gerald; Platon, Renato; Gamburzev,
 Serguei; Appleby, A. John; Velez, Omourtag A. (1700 South Mount
 Prospect Road, Institute of Gas Technology, Des Plaines, IL, USA). J.
 Power Sources, 71(1,2), 249-255 (English) 1998 Elsevier Science
 S.A. CODEN: JPSODZ. ISSN: 0378-7753. DOCUMENT TYPE:

Journal CA Section: 52 (Electrochemical, Radiational, and Thermal
 Energy Technology)

As a first step of developing a polymer electrolyte membrane fuel cell
 (PEMFC) that can operate for thousands of hours using a reformed
 fuel, we used an anode gas feed of 80% H₂ and 20% CO₂ to simulate
 the reforming of CH₄. To investigate the effect of reformat on cell
 performance and endurance, a single cell with an active area of 58 cm²
 was assembled with a membrane electrode assembly (MEA) using
 internally manifolded heat exchange (IMHEX) design configuration.
 The MEA consisted of a Nafion 112 membrane with anode and
 cathode Pt catalyst loadings of 0.26 and 1.46 mg/cm², resp. The cell
 was set to operate on a synthetic reformat-air at 60° and 1 atm, and
 demonstrated over 5000 h of endurance with a decay rate of less than
 1%/1000 h of operation. The cell also underwent four successful
 thermal cycles with no appreciable loss in performance. The stable
 performance is attributed to a combination of the IMHEX plate design
 with its inherent uniform gas flow distribution across the entire active
 area and MEA quality. The effects of temp., gas compn., fuel utilization
 (stoics), and thermal cycle on cell performance are described.

Keywords

polymer electrolyte membrane fuel cell performance
 reformat fuel synthetic fuel cell performance

Index Entries

Fuel cells

polymer electrolyte membrane; performance and endurance of
polymer electrolyte membrane fuel cells operated with
synthetic reformat fuel feed

7440-06-4, uses

catalytic electrodes; performance and endurance of polymer
electrolyte membrane fuel cells operated with synthetic
reformat fuel feed and using

163294-14-2

polymer electrolyte membrane; performance and endurance of
polymer electrolyte membrane fuel cells operated with
synthetic reformat fuel feed

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128:155141

Solventless mastic adhesives for automobile body panels and
adhesion method therewith.

Saito, Atsushi; Goto, Kiyoyuki; Umetani, Yusuke; Miyazaki, Yoshimi
(Sunstar Engineering, Inc.; Toyota Motor Corp., Japan). Jpn. Kokai
Tokkyo Koho JP 10025458 A2 27 Jan 1998 Heisei, 5 pp. (Japanese).
(Japan). CODEN: JKXXAF. CLASS: ICM: C09J121-00. ICS:

B62D065-00; C09J121-00; C09J127-06; C09J201-10.

APPLICATION: JP 96-183053 12 Jul 1996. DOCUMENT TYPE:

Patent CA Section: 38 (Plastics Fabrication and Uses) Section

cross-reference(s): 39

Title adhesives, useful in complete knockdown assembly lines,
comprise unvulcanized rubber and/or partially vulcanized rubber blends
with PVC, plasticizers, fillers, and 0.5-10% moisture-curable resins
contg. ³2 hydrolyzable silyl groups. A compn. of JSR-N 230SL 4, Nipol
1009 6, Kaneka PSH 10 10, CaCO₃ 35, CaO 5, a phthalate 40,
vinyltris(2-methoxyethoxy)silane coupler 1, Silyl SAT 200 3, and a Sn
catalyst 0.06 part showed a JIS A hardness of 20 and was used to
bind 2 steel panel with high-pressure shower resistance.

Keywords

automobile panel solventless rubber PVC adhesive
high pressure shower resistance adhesive automobile
moisture curable resin rubber PVC adhesive

Index Entries

Nitrile rubber, uses

JSR-N 230SL; moisture-curable resin-contg. rubber/PVC-based
solventless adhesives for automobile panels

Styrene-butadiene rubber, uses

Nipol 1009; moisture-curable resin-contg. rubber/PVC-based
solventless adhesives for automobile panels

Automobile bodies

Polymer blends

moisture-curable resin-contg. rubber/PVC-based solventless
adhesives for automobile panels

Adhesives

solventless; moisture-curable resin-contg. rubber/PVC-based
solventless adhesives for automobile panels

1067-53-4

coupler; moisture-curable resin-contg. rubber/PVC-based
solventless adhesives for automobile panels

9002-86-2

117630-79-2

168679-71-8

202606-38-0

moisture-curable resin-contg. rubber/PVC-based solventless

adhesives for automobile panels
9003-18-3

nitrile rubber, JSR-N 230SL; moisture-curable resin-contg.
rubber/PVC-based solventless adhesives for automobile
panels
9003-55-8

styrene-butadiene rubber, Nipol 1009; moisture-curable
resin-contg. rubber/PVC-based solventless adhesives for
automobile panels

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128:103042

Fast cure reactive hot melt adhesives maintain melt stability.
Hung, Ju-Ming (National Starch Chemical Co., Bridgewater, NJ, USA).
Adhes. Age, 40(2), 52-53 (English) 1997 Intertec Publishing Corp.
CODEN: ADHAAO. ISSN: 0001-821X. DOCUMENT TYPE: Journal
CA Section: 38 (Plastics Fabrication and Uses)
Fast cured RHM [reactive hot melt] adhesives are solvent-free
formulations with curing rate and initial strength, which result in
improved assembly rate of bonded substrates. A proprietary catalyst
is used for the purpose of effecting fast cure. The RHM adhesives
provide good melt stability, reliable cure under variably humidity, and
uniform quality.

Keywords

curing stability reactive hot melt adhesive

Index Entries

Thermal crosslinking
catalysts; stability and quality of fast cure reactive hot melt
adhesives
Hot melt adhesives
Thermal crosslinking
stability and quality of fast cure reactive hot melt adhesives
Crosslinking catalysts
thermal; stability and quality of fast cure reactive hot melt adhesives

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128:63895

Manufacture of secondary high charging-efficiency and fast
oxygen-recombination hydride and especially nickel-hydride
batteries.
Hong, Kuochih; Hong, Kuoshui; Hong, Huiyim (Taiwan). U.S. US
5695530 A 9 Dec 1997, 14 pp. Cont.-in-part of U.S. 5,541,017.
(English). (United States of America). CODEN: USXXAM. CLASS:
ICM: H01M004-38. NCL: 029623100. APPLICATION: US 96-661078
10 Jun 1996. PRIORITY: US 94-212354 14 Mar 1994. DOCUMENT
TYPE: Patent CA Section: 52 (Electrochemical, Radiational, and
Thermal Energy Technology) Section cross-reference(s): 56
The batteries include a high-rate, fast O-recombination and long-life H
storage anode. The H-storage material is prepd. to have a thin oxide
top surface layer and a metal (Ni)-rich subsurface layer. The hydride
anode has an electrochem. capacity of 1.15-2.40 A-h/cm³. Before or
after battery assembly, sealing, and/or using, the H-storage anode is
chem. or electrochem. precharged to a state having a half-cell
open-circuit potential of -0.790 to -0.905 V vs. Hg/HgO ref. electrode,
and to have an initial charging potential of -0.830 to -1.005 V vs.
Hg/HgO ref. electrode at a c.d. of 100 mA/g active material. The
H-storage anode includes at least a H-storage material (alloy), and/or
its hydride. The H-storage material consists of >18-<80 and preferably
>30-<65 at.% Ni and ³5 other elements as modifiers. The modifiers

include ³2 hydride formers selected from Ti, Zr, Hf, V, Nb, Ta, Y, Sc, Mg, Ca, Pd, and rare earth metals; ³1 destabilizing agent selected from Cr, Mn, Fe, Co, Cu, Zn, Mo, Sn, C, B, Sb, Si, Bi, Ge, Ga, N, O, and Sn; ³1 element selected from the corrosion-resisting agents selected from Cr, Co, W, Mo, Nb, Hf, and Ta; and ³1 element selected from O getters and/or catalysts. The O getter is selected from alkali metals, Ca, Al, Sr, Ba, Zr, Hf, Ti, rare earth metals, P, and S. The catalyst is selected from Cu, Mn, W, Mo, Pd, Co and O.

Keywords

nickel hydride battery anode
oxide coating nickel alloy hydrogen anode

Index Entries

Secondary batteries
manuf. of high charging-efficiency nickel-hydride
Battery anodes
manuf. of hydrogen-absorbing nickel alloy nickel-hydride
200355-86-8
200355-87-9
200355-88-0
200355-89-1
200355-90-4
200355-91-5
manuf. of nickel-hydride batteries having anodes of
1333-74-0, uses
manuf. of nickel-hydride batteries having anodes of nickel alloys
absorbing

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128:35351

Preparation and assembly of nanosized polymer latex.

Du, Hui; Chen, Ping; Liu, Fengqi; Meng, Fan-dong; Li, Tie-jin; Tang, Xin-yi (Department of Chemistry, University of Jilin, Changchun 130023, Peop. Rep. China). Mater. Chem. Phys., 51(3), 277-282

(English) 1997 Elsevier Science S.A. CODEN: MCHPDR. ISSN: 0254-0584. DOCUMENT TYPE: Journal CA Section: 37 (Plastics

Manufacture and Processing)

Monodispersed styrene-Bu acrylate-acrylic acid copolymer latexes with diam. <100 nm were prep'd. by semi-continuous emulsion polymn. using potassium persulfate as initiator and sodium dodecyl sulfate and polyethylene glycol p-octylphenyl ether as surfactant. The particle size and size distribution were affected by the total emulsifier amt., the pre-added emulsifier concn., and the agitation speed. The latex particles were assembled into two-dimensional arrays on substrates. Owing to the surface groups such as -COOH and -SO₄ derived from the comonomers and emulsifiers, the film formation to some degree, was affected by the electrostatic interaction between two particles as well as by capillary force. Different electrolytes were added into the colloid to adjust the particle interaction so that the attractive and repulsive forces were properly balanced and the ordered arrays were obtained.

Keywords

acrylic acid copolymer monodispersed latex
butyl acrylate copolymer monodispersed latex
styrene copolymer monodispersed latex
particle size styrene copolymer latex
potassium persulfate catalyst polymn vinyl
emulsifier sodium dodecyl sulfate polymn vinyl
polyoxyethylene octylphenyl ether emulsifier

Index Entries

Emulsifying agents
 polyoxyethylene octylphenyl ether and sodium dodecyl sulfate;
 prepn. of acrylic acid-Bu acrylate-styrene copolymer latexes
 in presence of
 Polymerization catalysts
 potassium persulfate; prepn. of acrylic acid-Bu acrylate-styrene
 copolymer latexes in presence of
 Particle size
 Particle size distribution
 Polymer morphology
 prepn. and characterization of acrylic acid-Bu acrylate-styrene
 copolymer latexes
 7727-21-1
 catalysts; prepn. of acrylic acid-Bu acrylate-styrene copolymer
 latexes in presence of
 151-21-3, uses
 9036-19-5
 emulsifiers; prepn. of acrylic acid-Bu acrylate-styrene copolymer
 latexes in presence of
 25586-20-3
 latexes; prepn. and characterization of
 1643-19-2
 7647-14-5, uses
 prepn. of acrylic acid-Bu acrylate-styrene copolymer latexes in
 presence of

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130:198787
 Catalyst for membrane electrode assembly and method of making.
 Debe, Mark K.; Haugen, Gregory M.; Steinbach, Andrew J.; Thomas,
 John H., III; Ziegler, Raymond J. (Minnesota Mining and Manufacturing
 Company, USA). U.S. US 5879827 A 9 Mar 1999, 20 pp. (English).
 (United States of America). CODEN: USXXAM. CLASS: ICM:
 H01M004-86. NCL: 429040000. APPLICATION: US 97-948910 10
 Oct 1997. DOCUMENT TYPE: Patent CA Section: 52
 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 67, 72, 76
 Nanostructured elements are provided for use in the electrode of a
 membrane electrode assembly for use in fuel cells, sensors,
 electrochem. cells, and the like. The nanostructured elements
 comprise acicular microstructured support whiskers bearing acicular
 nanoscopic catalyst particles which may comprise alternating layers of
 catalyst materials, which may comprise a surface layer that differs in
 compn. from the bulk compn. of the catalyst particles, and which may
 demonstrate improved carbon monoxide tolerance.

Keywords

fuel cell membrane electrode assembly catalyst
 sensor membrane electrode assembly catalyst
 electrochem cell membrane electrode assembly catalyst

Index Entries

Polyoxyalkylenes, uses
 fluorine- and sulfo-contg., ionomers; nanostructured catalyst for
 membrane electrode assembly for fuel cells and sensors
 Electrocatalysts
 Fuel cell electrodes
 Fuel cells
 Membranes (nonbiological)
 Nanostructures

Sensors

Sputter deposition

Carbon black, uses

nanostructured catalyst for membrane electrode assembly for fuel cells and sensors

Fluoropolymers, uses

polyoxyalkylene-, sulfo-contg., ionomers; nanostructured catalyst for membrane electrode assembly for fuel cells and sensors

Ionomers

polyoxyalkylenes, fluorine- and sulfo-contg.; nanostructured catalyst for membrane electrode assembly for fuel cells and sensors

Polyimides, uses

substrate; nanostructured catalyst for membrane electrode assembly for fuel cells and sensors

7440-44-0, uses

cloth; nanostructured catalyst for membrane electrode assembly for fuel cells and sensors

6424-77-7

film, on polyimide substrate; nanostructured catalyst for membrane electrode assembly for fuel cells and sensors

7440-06-4, uses

7440-18-8, uses

12714-36-2

12779-05-4

121232-02-8

66796-30-3

4948-15-6

nanostructured catalyst for membrane electrode assembly for fuel cells and sensors

630-08-0, miscellaneous

tolerance to; nanostructured catalyst for membrane electrode assembly for fuel cells and sensors

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130:198679

Catalyst guard bed for fixed-bed reactor assembly in hydroprocessing of heavy petroleum feeds.

Trimble, Harold J.; Cash, Dennis R. (Chevron U.S.A. Inc., USA). U.S. US 5879642 A 9 Mar 1999, 19 pp. (English). (United States of America). CODEN: USXXAM. CLASS: ICM: B01J008-04. NCL: 422191000. APPLICATION: US 96-639057 24 Apr 1996.

DOCUMENT TYPE: Patent CA Section: 51 (Fossil Fuels, Derivatives, and Related Products) Section cross-reference(s): 47

Heavy hydrocarbon feedstocks are hydroprocessed through multistage fixed catalyst beds contained within a single onstream reactor vessel, with a sep. catalyst addn. and a sep. catalyst withdrawal system for the upper or top essentially fixed catalyst bed. The upper or top essentially fixed catalyst bed functions as a guard catalyst bed for removing a major proportion of contaminants (i.e., organometallic constituents) from a hydrocarbon feed stream in order to extend the life of one or more fixed catalyst beds serially disposed underneath the upper or top catalyst guard bed. Catalyst particles are withdrawn from the essentially fixed catalyst bed by slurring or fluidizing the catalyst particles in a container disposed within the reactor. The method also describes a means for retrofitting a reactor assembly having two or more fixed catalyst beds in order to place a guard catalyst bed in the upper or top portion of the reactor assembly.

Keywords

petroleum hydroprocessing catalyst guard bed
reactor assembly guard bed petroleum hydroprocessing

Index Entries

Petroleum hydrotreating
 app.; catalyst guard bed for fixed-bed reactor assembly in
 hydroprocessing of heavy petroleum feeds
 Petroleum hydrotreating
 catalyst guard bed for fixed-bed reactor assembly in
 hydroprocessing of heavy petroleum feeds
 Petroleum refining residues
 hydroprocessing of; catalyst guard bed for fixed-bed reactor
 assembly in hydroprocessing of heavy petroleum feeds
 Reactors
 petroleum refining, guard beds, for hydrotreating; catalyst guard
 bed for fixed-bed reactor assembly in hydroprocessing of
 heavy petroleum feeds
 Petroleum refining
 reactors, guard beds, for hydrotreating; catalyst guard bed for
 fixed-bed reactor assembly in hydroprocessing of heavy
 petroleum feeds

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131:259912

Membrane electrode assembly for polymer electrolyte membrane fuel
 cell and method for its manufacture.
 Zuber, Ralf; Fehl, Knut; Starz, Karl-anton; Stenke, Udo (Degussa-Huls
 A.-G., Germany). Eur. Pat. Appl. EP 945910 A2 29 Sep 1999, 13 pp.
 DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT,
 LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (German). (European
 Patent Organization). CODEN: EPXXDW. CLASS: ICM:
 H01M008-10. ICS: H01M004-92. APPLICATION: EP 1999-104630 9
 Mar 1999. PRIORITY: DE 1998-19812592 23 Mar 1998.
 DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical,
 Radiational, and Thermal Energy Technology) Section
 cross-reference(s): 37, 67
 The membrane electrode assembly of the fuel cell comprises a
 polymer electrolyte membrane with porous reaction layers contg.
 catalysts and ionomers on both sides of the membrane. The reaction
 layer has an inhomogeneous microstructure formed from an
 ionomer-impregnated and embedded catalyst portion and an
 ionomer-free catalyst portion in wt. ratio (1-20):1, esp. (3-10):1. The
 catalyst can be carbon-supported Pt-group metal or alloy particles.
 The reaction layer has pore vol. 0.7-1.3, esp. 0.8-1.2 mL/g, for pores
 with diam. 0.03-1 mm, and thickness 5-100, esp. 10-100 mm. The
 ionomer can be a proton-conducting tetrafluoroethylene-fluorovinylether
 copolymer contg. acid groups, e.g., Nafion.

Keywords

membrane electrode assembly PEM fuel cell
 polymer electrolyte membrane fuel cell

Index Entries

Carbon black, uses
 catalyst supports; membrane electrode assembly for polymer
 electrolyte membrane fuel cells
 Platinum-group metals
 catalysts; membrane electrode assembly for polymer electrolyte
 membrane fuel cells
 Polyoxalkylenes, uses
 fluorine- and sulfo-contg., ionomers, proton-conducting; membrane
 electrode assembly for polymer electrolyte membrane fuel
 cells

Fuel cell electrolytes
 polymer membranes; membrane electrode assembly for polymer
 electrolyte membrane fuel cells
 Fuel cells
 polymer-electrolyte-membrane; membrane electrode assembly for
 polymer electrolyte membrane fuel cells
 Fluoropolymers, uses
 polyoxyalkylene-, sulfo-contg., ionomers, proton-conducting;
 membrane electrode assembly for polymer electrolyte
 membrane fuel cells
 Ionomers
 polyoxyalkylenes, fluorine- and sulfo-contg., proton-conducting;
 membrane electrode assembly for polymer electrolyte
 membrane fuel cells
 Fluoropolymers, uses
 Ionomers
 proton-conducting; membrane electrode assembly for polymer
 electrolyte membrane fuel cells
 Alcohols, uses
 Glycol ethers
 Glycols, uses
 Hydrocarbons, uses
 Paraffin oils
 solvents; membrane electrode assembly for polymer electrolyte
 membrane fuel cells
 Solvents
 weakly polar; nonpolar; membrane electrode assembly for
 polymer electrolyte membrane fuel cells
 7440-05-3, uses
 7440-06-4, uses
 7440-16-6, uses
 catalysts; membrane electrode assembly for polymer electrolyte
 membrane fuel cells
 77950-55-1
 membranes; membrane electrode assembly for polymer
 electrolyte membrane fuel cells
 7439-89-6, uses
 7439-98-7, uses
 7440-02-0, uses
 7440-18-8, uses
 7440-33-7, uses
 7440-47-3, uses
 7440-48-4, uses
 7440-50-8, uses
 7440-62-2, uses
 platinum group metals alloyed with, catalysts; membrane electrode
 assembly for polymer electrolyte membrane fuel cells
 116-14-3, fluorovinylether copolymers, functionalized
 57578-63-9, functionalized
 proton-conducting; membrane electrode assembly for polymer
 electrolyte membrane fuel cells
 56-81-5, uses
 57-55-6, uses
 107-41-5
 110-38-3
 111-82-0
 463-79-6, alkyl esters
 25265-71-8
 solvents; membrane electrode assembly for polymer electrolyte
 membrane fuel cells

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131:146954

Direct deposit of catalyst on the membrane of direct-feed fuel cells.

Chun, William; Narayanan, Sekharipuram R.; Jeffries-Nakamura, Barbara; Valdez, Thomas I.; Linke, Juergen (California Institute of Technology, USA). PCT Int. Appl. WO 9939841 A1 12 Aug 1999, 36 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: B05D005-12. ICS: B05D001-02; A62B018-00; A62C013-62; B05B007-30; B05B015-00; B05B001-30; A61M011-06; C25B011-00; C25B011-03; C25B011-04; C25B013-00; H01M008-10; H01M004-86; H01M006-00; B23P019-00. APPLICATION: WO 1999-US2836 9 Feb 1999. PRIORITY: US 1998-21692 10 Feb 1998. DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology)

A solid membrane electrolyte and membrane electrode assembly are prepd. for a direct liq.-feed fuel cell, resulting in improved catalyst use and an improved catalyst/membrane interface. The catalyst layer is applied directly onto the solid electrolyte membrane as an ink. The catalyst ink is prepd. by mixing a catalyst (e.g., Pt or Pt-Ru) with a water repellent material (e.g., PTFE) and an ionomer (Nafion) soln. The solid electrolyte membrane, e.g., a perfluorinated proton exchange membrane, is pretreated (with isopropanol) to soften and swell the membrane prior to coating. The pretreated membrane is held in a frame and the catalyst ink is poured or sprayed directly onto the membrane surface and then spread with a glass rod. The coated membrane is dried by slow evapn. Support substrates (e.g., carbon paper) are placed on each side of the catalyst-coated membrane, then the layers are bonded by hot pressing to form the membrane electrode assembly. The membrane electrode assembly can be used in a direct-feed methanol fuel cell.

Keywords

membrane electrode assembly prepn fuel cell
fuel cell direct feed membrane electrode assembly

Index Entries

Cation exchange membranes
Spraying apparatus
Fluoropolymers, uses
Alcohols, uses
direct catalyst deposition on membrane of direct-feed fuel cells
Fuel cells
direct-feed; direct catalyst deposition on membrane of direct-feed fuel cells
Polyoxyalkylenes, uses
fluorine- and sulfo-contg., ionomers; direct catalyst deposition on membrane of direct-feed fuel cells
Fuel cell electrolytes
Fluoropolymers, uses
membranes; direct catalyst deposition on membrane of direct-feed fuel cells
Carbon fibers, uses
paper, supports; direct catalyst deposition on membrane of direct-feed fuel cells
Fluoropolymers, uses
polyoxyalkylene-, sulfo-contg., ionomers; direct catalyst deposition on membrane of direct-feed fuel cells
Ionomers

polyoxyalkylenes, fluorine- and sulfo-contg.; direct catalyst deposition on membrane of direct-feed fuel cells
7440-06-4, uses
7440-18-8, uses
9002-84-0
67-63-0, uses
direct catalyst deposition on membrane of direct-feed fuel cells

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131:90267

Continuous method for manufacturing a laminated electrolyte and electrode assembly.

Preischl, Christine; Hedrich, Peter; Hahn, Alfred (Ballard Power Systems Inc., Can.). PCT Int. Appl. WO 9934466 A1 8 Jul 1999, 27 pp.

DESIGNATED STATES: W: AU, CA, DE, GB, JP, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). (World Intellectual Property Organization). CODEN: PIXXD2.

CLASS: ICM: H01M008-10. ICS: C25B009-00. APPLICATION: WO 1998-CA1160 22 Dec 1998. PRIORITY: US 1997-68797 24 Dec 1997; US 1998-216207 18 Dec 1998. DOCUMENT TYPE: Patent CA

Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 38

A continuous method manufs. a laminated electrolyte and electrode assembly ("laminated assembly") comprising at least one pre-formed electrode layer, at least one catalyst layer and at least one electrolyte layer for an electrochem. cell. The method comprises forming at least one of the catalyst or electrolyte layers in situ and using it as a laminating medium. The method produces a laminated assembly in a continuous sheet, which may be later cut to size and shape for use in electrochem. cells. The method may comprise co-extruding granular catalyst and/or electrolyte materials. In one embodiment, the catalyst and electrolyte layers are co-extruded. The co-extruded tri-layer extrusion is laminated with immediately adjacent pre-formed electrode layers. In another embodiment the catalyst layer is extruded and the catalyst layer acts as the laminating medium between immediately adjacent pre-formed electrode and electrolyte layers. In a further embodiment the catalyst layers are applied to two sep. pre-formed electrode layers, and the catalyst coated electrode layers are laminated with an electrolyte layer formed in situ which serves as the laminating medium.

Keywords

fuel cell laminated electrolyte electrode assembly

Index Entries

Carbon fibers, uses

cloth; continuous method for manufg. laminated electrolyte and electrode assembly

Conducting polymers

Electrocatalysts

Fuel cell electrodes

Fuel cell electrolytes

Fuel cells

Laminated materials

Fluoropolymers, uses

continuous method for manufg. laminated electrolyte and electrode assembly

Polyketones

polyether-; continuous method for manufg. laminated electrolyte and electrode assembly

Polyethers, uses

polyketone-; continuous method for manufg. laminated electrolyte

and electrode assembly
7440-06-4, uses
26838-51-7, sulfonated
60015-03-4
continuous method for manufg. laminated electrolyte and electrode
assembly
7440-44-0, uses
paper; continuous method for manufg. laminated electrolyte and
electrode assembly

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130:325458

Coassembly of a hexagonal columnar liquid crystalline superlattice
from polymer(s) coated with a three-cylindrical bundle
supramolecular dendrimer.
Percec, Virgil; Ahn, Cheol-H.; Bera, Tushar K.; Ungar, Goran; Yeardley,
Duncan J. P. (The W. M. Keck Laboratories for Organic Synthesis
Department of Macromolecular Science, Case Western Reserve
University, Cleveland, OH 44106-7202, USA). Chem.--Eur. J., 5(3),
1070-1083 (English) 1999 Wiley-VCH Verlag GmbH. CODEN:
CEUJED. ISSN: 0947-6539. DOCUMENT TYPE: Journal CA
Section: 35 (Chemistry of Synthetic High Polymers) Section
cross-reference(s): 25, 36, 75
The synthesis and structural anal. of a polymer contg. twin-dendritic
benzamide side-groups (i.e.
poly{N-[3,4-bis(n-dodecan-1-yloxy)-5-(1-methacryloyl-n-undecan-1-yloxy
)-phenyl]-3,4,5-tris(n-dodecan-1-yloxy)-benzamide}) (I) are described.
The disk-like side groups of this polymer self-assemble into supramol.
cylindrical dendrimers through hydrogen bonding acting along the
column long axis, creating a novel architecture consisting of polymer
chain(s) coated with a three-cylindrical bundle supramol. dendrimer.
This polymer self-organizes in a thermotropic nematic liq. cryst. (LC)
phase. The low mol. wt. twin dendritic benzamide (II), which has a
similar structure to that of the polymer side groups, self-assembles into
supramol. cylindrical dendrimers, which self-organize on a
two-dimensional hexagonal columnar (Fh) LC lattice. Co-assembly of
the I polymer with II produces a novel two-dimensional Fh LC
superlattice. The mechanism responsible for this co-assembly
provides access to libraries of functional two-dimensional Fh
superlattices.

Keywords

liq crystal superlattice polyacrylate twin benzamide prepn
dendrimer oxyalkylene side chain benzamide polyacrylate self
assembly

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polyacrylate superlattice
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nematic, isotropic, hexagonal columnar; prepn. and supramol.
structures of dendritic oxyalkylene benzamides and
co-assembly with prepd. hexagonal columnar liq. cryst.
benzamide-contg. polyacrylate superlattice
Liquid crystalline polymers
nematic; prepn. and supramol. structures of dendritic oxyalkylene
benzamides and co-assembly with prepd. hexagonal
columnar liq. cryst. benzamide-contg. polyacrylate
superlattice

Nematic liquid crystals
 polymeric; prepn. and supramol. structures of dendritic oxyalkylene
 benzamides and co-assembly with prepd. hexagonal
 columnar liq. cryst. benzamide-contg. polyacrylate
 superlattice
 Chlorination
 Demethylation
 Hydrogen bond
 Methylation
 Nematic liquid crystals
 Nitration
 Polymer chain orientation
 Polymer phase morphology
 Radical polymerization
 Self-assembly
 Superlattices
 prepn. and supramol. structures of dendritic oxyalkylene
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 Dendritic polymers
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 condensation reagent; prepn. and supramol. structures of dendritic
 oxyalkylene benzamides and co-assembly with prepd.
 hexagonal columnar liq. cryst. benzamide-contg.
 polyacrylate superlattice
 223764-27-0
 223764-36-1
 dendritic; prepn. and supramol. structures of dendritic oxyalkylene
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 columnar liq. cryst. benzamide-contg. polyacrylate
 superlattice
 74-88-4, reactions
 223764-34-9
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 polyacrylate superlattice
 223764-35-0
 monomer; prepn. and supramol. structures of dendritic oxyalkylene
 benzamides and co-assembly with prepd. hexagonal
 columnar liq. cryst. benzamide-contg. polyacrylate
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 223764-22-5
 223764-18-9
 223764-19-0
 223764-20-3
 223764-21-4
 223764-23-6
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 223764-25-8
 223764-26-9
 87-66-1
 99-24-1
 109-65-9
 111-25-1
 112-29-8
 112-89-0
 143-15-7
 920-46-7
 1611-56-9

7697-37-2, reactions

7719-09-7

96642-97-6

102020-55-3

102310-68-9

117241-31-3

119891-30-4

123126-39-6

126229-90-1

142050-18-8

151237-01-3

151237-05-7

151237-08-0

158921-39-2

188438-95-1

188685-16-7

188685-17-8

188685-33-8

223764-16-7

223764-17-8

223764-28-1

223764-29-2

223764-30-5

223764-31-6

223764-32-7

223764-33-8

prepn. and supramol. structures of dendritic oxyalkylene benzamides and co-assembly with prepd. hexagonal columnar liq. cryst. benzamide-contg. polyacrylate superlattice

78-67-1

radical polymn. catalyst; prepn. and supramol. structures of dendritic oxyalkylene benzamides and co-assembly with prepd. hexagonal columnar liq. cryst. benzamide-contg. polyacrylate superlattice

302-01-2, reactions

reducing agent; prepn. and supramol. structures of dendritic oxyalkylene benzamides and co-assembly with prepd. hexagonal columnar liq. cryst. benzamide-contg. polyacrylate superlattice

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131:146953

A method of forming a membrane electrode assembly for a direct-feed fuel cell.

Kindler, Andrew; Dawson, Stephen F. (California Institute of Technology, USA). PCT Int. Appl. WO 9939840 A1 12 Aug 1999, 22 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: B05D005-12. ICS: H01M004-00; H01M008-10; H01M004-86; B23P019-00.

APPLICATION: WO 1999-US2835 9 Feb 1999. PRIORITY: US

1998-21694 10 Feb 1998. DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology)

A catalyst-coated electrode for a fuel cell is prepd. by mixing a catalyst (e.g., Pt or Pt-Ru) with a water repellent material (e.g., PTFE) to form a catalyst ink that is applied to an electrode backing material (e.g., porous carbon fiber sheet). The coated electrode is sintered

under N₂, cooled to 25°C, then coated with a liq. ionomer (e.g., Nafion--a perfluorovinylether sulfonic acid-tetrafluoroethylene copolymer) forming an anode or cathode. A solid electrolyte membrane, e.g., a perfluorinated proton exchange membrane, is pretreated (with isopropanol) to soften and swell the membrane prior to hot press bonding between the anode and cathode to form a membrane electrode assembly. Swelling the membrane before bonding results in shrinkage at the interface during use, reducing delamination. The electrode assembly can be used in a direct-feed methanol fuel cell.

Keywords

membrane electrode assembly prepn fuel cell
fuel cell direct feed membrane electrode assembly

Index Entries

Fuel cells

direct-feed; membrane electrode assembly prepn. for direct-feed
fuel cells

Polyoxyalkylenes, uses

fluorine- and sulfo-contg., ionomers; membrane electrode
assembly prepn. for direct-feed fuel cells

Cation exchange membranes

Fuel cell electrodes

Gas diffusion electrodes

Fluoropolymers, uses

membrane electrode assembly prepn. for direct-feed fuel cells

Fuel cell electrolytes

Fluoropolymers, uses

membranes; membrane electrode assembly prepn. for direct-feed
fuel cells

Fluoropolymers, uses

polyoxyalkylene-, sulfo-contg., ionomers; membrane electrode
assembly prepn. for direct-feed fuel cells

Ionomers

polyoxyalkylenes, fluorine- and sulfo-contg.; membrane electrode
assembly prepn. for direct-feed fuel cells

Carbon fibers, uses

sheets, porous, electrode backing material; membrane electrode
assembly prepn. for direct-feed fuel cells

9083-53-8

dispersing agent; membrane electrode assembly prepn. for
direct-feed fuel cells

7440-06-4, uses

7440-18-8, uses

9002-84-0

67-63-0, uses

7727-37-9, uses

membrane electrode assembly prepn. for direct-feed fuel cells

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131:202232

Elongate air depolarized batteries with seals.

Dopp, Robert B.; Moy, Gregory Scott; Passaniti, Joseph Lynn; Oltman,
John Edward; Ward, Michael Andrew (Rayovac Corporation, USA).

Eur. Pat. Appl. EP 940870 A2 8 Sep 1999, 74 pp. DESIGNATED

STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,
MC, PT, IE, SI, LT, LV, FI, RO. (English). (European Patent

Organization). CODEN: EPXXDW. CLASS: ICM: H01M012-06. ICS:

H01M004-86; H01M002-08. APPLICATION: EP 1999-301729 8 Mar

1999. PRIORITY: US 1998-77037 6 Mar 1998; US 1998-91384 1 Jul

1998. DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical,

Radiational, and Thermal Energy Technology) Section
cross-reference(s): 38

An elongate, generally tubular, air depolarized battery comprises a cathode, including an air cathode assembly, extending about the tubular circumference, and along the tubular length, of the cell, an anode, a separator between the anode and the cathode, electrolyte, a top closure member, and a bottom closure member. The cathode assembly is fixedly held, by a friction fit, in a slot at the bottom of the cell. The slot can be developed, for example, by inner and outer walls of a cathode can, by inner and outer walls of a bottom closure member, or by an outer wall of a cathode can and an opposing outer wall of a plug on the interior of the cell. Preferably, bottom closure structure of the cell receives a bottom edge portion of the cathode current collector, and makes elec. contact with the bottom edge portion, preferably at an inner surface of the cathode current collector. A diffusion member of the cathode assembly is preferably compressed as a seal, at the bottom of the cell, between an outer side wall of the cell and the remainder of the cathode assembly. The diffusion member is also used at least as an assist in sealing the cell against electrolyte leakage from the anode cavity and past the cathode assembly. A grommet closes the top of the cell. A seal can extend upwardly into a slot between the grommet and a top closure member such as at the top of a cathode can, or a sep. top closure member. Cathode assembly and separator can extend into the slot. The seal is between the grommet and cathode assembly, or between grommet and separator, or both. The seal can extend upwardly into the slot from an outer surface of the cathode assembly, can extend about resp. upper edges of the cathode current collector, catalyst, and separator, and downwardly toward, preferably against or along the inner surface of, the separator. The top closure member can be crimped against the grommet at the slot, with the cathode assembly, and optionally the separator, in the slot between the grommet and the top closure, thus to provide a liq.-tight crimp seal. The top closure can be crimped first against the grommet at the slot, and further crimped against the grommet at a second locus displaced longitudinally from the first crimp. Compn. of the seal comprises a microporous polymer, preferably polytetrafluoroethylene. Preferred embodiments comprise at least two, preferably at least three, layers of air permeable microporous sheet material, useful for diffusion of air there-through to the cathode reaction surface. The layers are wrapped continuously and without intervening end, to form an outer surface of the cathode assembly. Another expression of the invention is a cathode assembly, or cathode-separator combination, for use in an elongate air depolarized cell. The air permeable sheet material, as wrapped about the tubular cathode assembly, is compressed so as to have a compressed thickness less than the uncompressed thickness.

Keywords

seal air depolarized battery

Index Entries

Battery cathodes
Primary batteries
Seals (parts)
Fluoropolymers, uses
elongate air depolarized batteries with seals
9002-84-0
elongate air depolarized batteries with seals

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131:150608

Preparation and performance evaluation of membrane electrode

assemblies for polymer electrolyte fuel cell.

Peck, D.-H.; Chun, Y.-G.; Kim, C.-S.; Jung, D.-H.; Shin, D.-R. (Korea Institute of Energy Research, Taejon 305-343, S. Korea). J. New Mater. Electrochem. Syst., 2(2), 121-124 (English) 1999 Journal of New Materials for Electrochemical Systems. CODEN: JMESFQ. ISSN: 1480-2422. DOCUMENT TYPE: Journal CA Section: 72 (Electrochemistry) Section cross-reference(s): 52, 67

In order to evaluate performance characteristics of the membrane electrode assembly (MEA) for polymer electrolyte fuel cell (PEFC), three com. available Nafion membranes (112, 115, and 117), and Pt/C, PtNi/C and PtNiCo/C electrocatalysts were used in the fabrication of the MEAs by using transfer printing technique. The electrocatalyst layer of the MEA has been made by using a slurry of carbon-supported catalyst, Nafion-ionomers and glycerin. The effects of the thickness of Nafion membranes, electrocatalysts and the operating conditions (i.e. temp., reactant gas pressure, and compn.) on the performance of the MEA were investigated in the PEFC single cell. The performance of the MEA made from Nafion 112, 115, and 117 membrane for O₂/H₂ cell were 1.16, 0.82, and 0.54 A/cm² at 0.6V. An increase of reactants pressures up to 3 atm has stronger effect on the performance of Air/H₂ cell than on that of O₂/H₂ cell. The performances of the MEA made from PtNi/C alloy catalyst for O₂/H₂ and Air/H₂ cells at 80° were 0.86 and 0.48 A/cm² at 0.6V, resp., and in the case of PtNiCo/C alloy catalyst, the MEAs for O₂/H₂ and Air/H₂ cells showed similar performance.

Keywords

membrane electrode assembly polymer electrolyte fuel cell
Nafion membrane oxygen hydrogen fuel cell
cobalt nickel platinum carbon electrocatalyst

Index Entries

Electrocatalysts

Pt/C, PtNi/C and PtNiCo/C electrocatalysts used in fabrication of membrane electrode assembly for polymer electrolyte fuel cell by using transfer printing technique

Surface structure

for electrocatalyst layer in membrane electrode assembly for polymer electrolyte fuel cell

Electrolytic polarization

for membrane electrode assembly made with various Nafion membranes

Fuel cells

Membrane electrodes

prepn. and performance evaluation of membrane electrode assemblies for polymer electrolyte fuel cell

7440-06-4, uses

Pt/C electrocatalysts used in fabrication of membrane electrode assembly by using transfer printing technique
12623-53-9

PtNi/C electrocatalysts used in fabrication of membrane electrode assembly by using transfer printing technique
60596-33-0

7440-44-0, uses

PtNiCo/C electrocatalysts used in fabrication of membrane electrode assembly by using transfer printing technique
66796-30-3

77950-55-1

163294-14-2

membrane electrode assembly made with various Nafion membranes

1333-74-0, uses

7782-44-7, uses

performance of membrane electrode assembly for polymer electrolyte fuel cell made from Nafion 112, 115, and 117 membrane for O₂/H₂ cell

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130:354757

Improved HSPES membrane electrode assembly.

Kindler, Andrew; Yen, Shiao-Ping (California Institute of Technology, USA). PCT Int. Appl. WO 9927600 A1 3 Jun 1999, 28 pp.

DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). (World Intellectual Property Organization).

CODEN: PIXXD2. CLASS: ICM: H01M008-10. ICS: H01M008-22;

H01M004-88. APPLICATION: WO 98-US25048 23 Nov 1998.

PRIORITY: US 97-66849 25 Nov 1997. DOCUMENT TYPE: Patent

CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 38

Improvements to electrode assemblies useful in fuel cells is provided. The electrode assembly results in improved catalytic function as a result of the availability of free-catalyst. The fuel cell electrode comprises a backing material (C paper) having a sintered layer thereon, and a nonsintered free catalyst layer.

Keywords

fuel cell membrane electrode assembly

Index Entries

Copying paper

carbon paper; improved membrane electrode assembly for fuel cells

Polyoxyalkylenes, uses

fluorine- and sulfo-contg., ionomers; improved membrane electrode assembly for fuel cells

Electrocatalysts

Fuel cell electrodes

Fuel cell electrolytes

Fuel cells

improved membrane electrode assembly for fuel cells

Fluoropolymers, uses

polyoxyalkylene-, sulfo-contg., ionomers; improved membrane electrode assembly for fuel cells

Ionomers

polyoxyalkylenes, fluorine- and sulfo-contg.; improved membrane electrode assembly for fuel cells

Fluoropolymers, uses

waterproofing; improved membrane electrode assembly for fuel cells

7440-06-4, uses

improved membrane electrode assembly for fuel cells

9002-84-0

waterproofing; improved membrane electrode assembly for fuel cells

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131:185296

Preparation of polyacetylene esters bearing pseudohexagonal

structures using a Rh complex catalyst.

Tabata, Masayoshi; Sadahiro, Yoshikazu; Sone, Takeyuki; Inaba, Yasuo; Yokota, Kazuaki (Department of Molecular Chemistry, Graduate School of Engineering, Hokkaido University, Sapporo 060-8628 J, Japan). Kobunshi Ronbunshu, 56(6), 350-360 (Japanese) 1999

Kobunshi Gakkai. CODEN: KBRBA3. ISSN: 0386-2186.

DOCUMENT TYPE: Journal CA Section: 35 (Chemistry of Synthetic High Polymers) Section cross-reference(s): 36, 38

Stereospecific polymn. of acetylene esters, HCYC-COOn-alkyl, was successfully performed using a [Rh-(norbornadiene)Cl]₂ catalyst to give rise to the corresponding cis-transoid polyacetylene esters in the presence of alc., which is the polymn. solvent by which the dimer catalyst was dissocd. The polyacetylene esters generate pseudo-hexagonal structures called columnar as the self-assembly in the solid state, although the columnar polymer has a helical structure as correlatively predicted by the semi-empirical quantum chem. calcn. method, AMI method. The poly(n-propiolate) polymer works as a highly oxygen permeable membrane. The sepn. factor a₁, PO₂/PN₂ = 3.4, is comparable to that for a typical oxygen permeable polymer reported before. The ESR parameters of radicals obsd. in the pristine cis polymer and thermally treated polymer are quite different from each other and those radicals are created by the rotational scission of the cis C=C bonds to generate nr-radicals called solitons. The ESR methods are useful for assignment of the resultant cis and trans geometrical isomers of this polymer because of the different obsd. ESR parameters.

Keywords

polyacetylene ester prepn stereospecific polymn pseudo-hexagonal structure
rhodium complex catalyst stereospecific polymn polyacetylene ester prepn
oxygen permeability membrane polypropiolate

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Solvent effect
on prepn. of polyacetylene esters bearing pseudo-hexagonal structures using Rh complex catalyst
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permeability of polyacetylene ester membranes bearing pseudo-hexagonal structures prepd. using Rh complex catalyst
Birefringence
Polymer morphology
Polymer side chains
prepn. and properties of polyacetylene esters bearing pseudo-hexagonal structures using Rh complex catalyst
Polymer chains
Stereospecific polymerization
Stereospecific polymerization catalysts
Polyacetylenes, preparation
prepn. of polyacetylene esters bearing pseudo-hexagonal structures using Rh complex catalyst
7727-37-9, processes
7782-44-7, processes
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10049-07-7
12092-47-6
12257-42-0
35238-97-2
27342-21-8

31762-50-2
 152107-30-7
 152107-31-8
 152107-32-9
 152107-33-0
 180593-30-0
 180593-31-1
 180593-32-2
 180593-33-3
 180593-34-4
 180593-35-5
 180593-36-6
 180593-37-7
 180593-38-8
 180593-39-9
 215301-21-6
 239810-55-0
 239810-56-1
 239810-58-3

prepn. of polyacetylene esters bearing pseudo-hexagonal structures
 using Rh complex catalyst

64-19-7, uses
 67-56-1, uses
 75-09-2, uses
 108-88-3, uses
 109-99-9, uses
 141-78-6, uses

solvent effect on prep. of polyacetylene esters bearing
 pseudo-hexagonal structures using Rh complex catalyst

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131:353624

Process and characteristics of high power catalyst electrode for PEM
 fuel cell.

Chang, H.; Lim, C.; Kim, J. (Electrochemistry Lab, Samsung Advanced
 Institute of Technology, Kyungki-Do, S. Korea). J. Korean Electrochem.
 Soc., 2(3), 171-175 (English) 1999 Korean Electrochemical Society.

CODEN: JKESFC. ISSN: 1229-1935. DOCUMENT TYPE: Journal

CA Section: 52 (Electrochemical, Radiational, and Thermal Energy
 Technology) Section cross-reference(s): 38

Novel process for high power catalyst electrode for PEM fuel cell has
 been developed. Membrane electrode assembly having this catalyst
 electrode showed 0.5 W/cm² with 0.2 mg/cm² of Pt loading at atm.
 humid hydrogen and oxygen condition. In this process, platinized
 carbon and plain carbon powders were coated with ionomer (Nafion)
 and hydrophobic polymer (PTFE), resp. and it could maximize two
 roles of catalyst electrode, i.e., reaction and gas supplying component.

Those polarization characteristics proved the improved performance
 by reducing potential drop esp. in the concn. polarization region.

Keywords

fuel cell catalyst electrode

Index Entries

Polyoxyalkylenes, uses

fluorine- and sulfo-contg., ionomers; process and characteristics of
 high power catalyst electrode for proton exchange
 membrane fuel cell

Fluoropolymers, uses

polyoxyalkylene-, sulfo-contg., ionomers; process and
 characteristics of high power catalyst electrode for proton
 exchange membrane fuel cell

Ionomers

polyoxyalkylenes, fluorine- and sulfo-contg.; process and characteristics of high power catalyst electrode for proton exchange membrane fuel cell

Fuel cell electrodes

Fluoropolymers, uses

process and characteristics of high power catalyst electrode for proton exchange membrane fuel cell

7440-06-4, uses

7440-44-0, uses

9002-84-0

process and characteristics of high power catalyst electrode for proton exchange membrane fuel cell

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131:248774

Preparation of catalyst supports, zeolites and mesoporous materials.

Doesburg, E. B. M.; De Jong, K. P.; Van Hooff, J. H. C. (Netherlands

Energy Research Foundation ECN, Losser 7581 VS, Neth.). Stud.

Surf. Sci. Catal., 123(Catalysis: An Integrated Approach (2nd Edition)),

433-457 (English) 1999 Elsevier Science B.V. CODEN: SSCTDM.

ISSN: 0167-2991. DOCUMENT TYPE: Journal; General Review CA

Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)

A review with 31 refs. Catalysts usually consist of two or more components in which the various constituents are assembled in the desired structure and shape. In this chapter we will consider the synthesis of a set of building blocks for the catalyst. The building blocks considered are support materials (silica, alumina and carbon), zeolites and mesoporous materials. Often the catalyst assembly process involves the addn. of an active (second) component onto these building blocks. A case in point is the emplacement of a metal onto the support materials in order to obtain so-called supported catalysts. Support materials are vehicles for the active phase. They exercise several functions, among which are the maximization of the surface area of the active phase by providing a large area over which it may be spread and allowing the catalyst to be case into the form of coarse bodies suitable for use in tech. reactors. The active phase usually constitutes between 0.1 and 20% of the total catalyst mass and is normally in the form of very small crystallites, e.g. 1nm Pt crystals or 50 nm Ag particles. The support is often supposed to be catalytically inactive by itself, however in partnership with the active phase it can participate in the total reaction in an important way (e.g. so-called bi-functional catalysis). Typical substances that find wide use as high-area supports include silica gel and g-alumina, which can be obtained with surface areas in the range 100-800 m²/g. Materials used as low surface area supports (~ 1 m²/g) include a-alumina and mullite (alumina-silica). Thses oxidic support materials are in fact ceramics with good thermal stability, which is relevant to obtain thermostable catalysts. Carbon is an attractive carrier because it is chem. inert in (aq.) liqs., which allows one to use it in liq.-phase catalysis for fine chem. synthesis. We discuss the synthesis of zeolites and, briefly, of mesoporous solids. It is not easy to make general statements about the prepn. of industrial catalysts, but in many cases one can distinguish between the chem. operations to assemble the chem. components, and the fabrication steps which the catalyst is made into the desired shape. The shaping procedures, unfortunately, are very empirical in nature. A descriptive summary of shaping methods used most frequently is given.

Keywords

catalyst support prepn review
zeolite prepn review

mesoporous material prepn review

Index Entries

Porous materials
 mesoporous; prepn. of catalyst supports, zeolites and
 mesoporous materials
 Catalyst supports
 Catalysts
 Ceramics
 Zeolites (synthetic), uses
 Oxides (inorganic), uses
 prepn. of catalyst supports, zeolites and mesoporous materials

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130:43397

Contact lens disinfection apparatus with catalyst to decompose
 hydrogen peroxide.

McAffer, Ian (Waverley Pharmaceutical Ltd., UK). Brit. UK Pat. Appl.
 GB 2321533 A1 29 Jul 1998, 14 pp. (English). (United Kingdom).
 CODEN: BAXXDU. CLASS: ICM: A61L002-18. ICS: G02C013-00.
 APPLICATION: GB 98-1547 23 Jan 1998. PRIORITY: GB 97-1339 23
 Jan 1997. DOCUMENT TYPE: Patent CA Section: 63
 (Pharmaceuticals)

An app. for the disinfection of contact lenses comprises a catalyst (Pt
 or PtO₂) as a catalyst for the promotion of H₂O₂ decompn., gradual
 erosion of the catalyst rendering the app. unsuitable for use after a
 period, preventing the use of disinfection app. in which potentially
 dangerous levels of pathogens have built up. The catalyst is provided
 as a part of the cap stem, basket assembly in the app. The lifetime of
 the catalyst is affected by both the thickness of the catalytic coating
 and the surface area covered.

Keywords

contact lens disinfection app catalyst hydrogen peroxide decompn
 platinum catalyst hydrogen peroxide decompn contact lens

Index Entries

Catalysts
 Contact lenses
 Disinfection
 contact lens disinfection app. with catalyst to decomp. hydrogen
 peroxide
 7440-06-4, uses
 11129-89-8
 7722-84-1, biological studies
 contact lens disinfection app. with catalyst to decomp. hydrogen
 peroxide

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131:358036

Visible Region Photooxidation on TiO₂ with a Chromophore-Catalyst
 Molecular Assembly.

Treadway, Joseph A.; Moss, John A.; Meyer, Thomas J. (Department
 of Chemistry, The University of North Carolina at Chapel Hill, Chapel
 Hill, NC 27599-3290, USA). Inorg. Chem., 38(20), 4386-4387
 (English) 1999 American Chemical Society. CODEN: INOCAJ. ISSN:
 0020-1669. DOCUMENT TYPE: Journal CA Section: 74 (Radiation
 Chemistry, Photochemistry, and Photographic and Other Reprographic
 Processes) Section cross-reference(s): 29, 52, 67, 72, 78
 The goal of the present study was to devise a photoelectrosynthetic cell

based on adsorption of
 $[(4,4'-(\text{CO}_2\text{H})_2\text{bpy})(4,4'-\text{Me}_2\text{bpy})\text{Ru}(\text{II})(\text{dpp})\text{Ru}(\text{II})(\text{tpy})(\text{OH}_2)]^{4+}$ (4,4'-Me₂ is 4,4'-dimethyl-2,2'-bipyridine, 4,4'-(CO₂H)₂bpy is 2,2'-bipyridine-4,4'-dicarboxylic acid, dpp is 2,3-bis(2-pyridyl)-pyrazine, and tpy is 2,2':6',2''-terpyridine) onto TiO₂. A two-compartment cell was utilized with the dye-derivatized TiO₂ electrode in one compartment and a platinized Pt electrode immersed in 1 M aq. HClO₄ in the second. In this configuration, the photo-injected electrons are delivered through the circuit to the platinized Pt electrode for redn. of protons to dihydrogen although we have made no attempt to measure its prodn.

Keywords

visible region photooxidn titania chromophore catalyst mol assembly
 ruthenium bipyridine complex photoelectrochem cell solar

Index Entries

Oxidation catalysts
 photooxidn.; visible region photooxidn. on TiO₂ with
 chromophore-catalyst mol. assembly
 Adsorbed monolayers
 Cyclic voltammetry
 Excited state
 Oxidation, photochemical
 Photoelectrochemical cells
 Photolysis
 UV and visible spectra
 visible region photooxidn. on TiO₂ with chromophore-catalyst mol.
 assembly
 25005-96-3
 72905-30-7
 170079-93-3
 250346-95-3
 250378-20-2
 250378-22-4
 prepn. of ruthenium polypyridine complex
 13463-67-7, uses
 250346-93-1
 250346-92-0
 67-63-0, properties
 visible region photooxidn. on TiO₂ with chromophore-catalyst mol.
 assembly

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131:341164

Gas sensing assembly.

Hobbs, Bryan Stewart; Capetanopolous, Constantine Dean (Sem Corporation, USA). PCT Int. Appl. WO 9957558 A1 11 Nov 1999, 21 pp. DESIGNATED STATES: W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: G01N033-00. APPLICATION: WO 1999-GB1384 4 May 1999. PRIORITY: GB 1998-9653 6 May 1998. DOCUMENT TYPE: Patent CA Section: 59 (Air Pollution and Industrial Hygiene) A gas sensing assembly to which a gas stream is supplied. A gas sensing assembly to which a gas stream is supplied comprises a catalyst converter for converting ³1 higher nitrogen oxides in the gas

stream to NO, and an electrochem. gas sensor for sensing ³¹ the gases in the gas stream output from the converter, which is a catalytic reactor contg. molybdenum alloy as a catalyst.

Keywords

gas sensing assembly exhaust gas analysis
nitrogen oxide detector exhaust gas analysis
sulfur dioxide detector exhaust gas analysis

Index Entries

Air pollution
control; gas sensing assembly
Air pollution
exhaust; gas sensing assembly
Air analysis
Exhaust gas catalytic converters
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Gas sensors
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7446-09-5, analysis
11104-93-1, analysis
7439-98-7, uses
77874-17-0
126364-05-4
249890-14-0
gas sensing assembly

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131:202159

Properties of nickel mesh as a methane steam reforming catalyst and its application in SOFCs.

Flesch, U.; Dahl, R.; Peters, R.; Stover, D. (Research Centre Julich/Forschungszentrum Julich (FZJ), Institute for Materials and Processing in Energy Systems (IWV), Julich D-52425, Germany).

Proc. - Electrochem. Soc., 99-19(Solid Oxide Fuel Cells (SOFC VI)), 612-620 (English) 1999 Electrochemical Society. CODEN: PESODO.

ISSN: 0161-6374. DOCUMENT TYPE: Journal CA Section: 52

(Electrochemical, Radiational, and Thermal Energy Technology)

The steam reforming reaction within the anode chamber, catalyzed by the nickel of the anode substrate, is very fast and influences the temp. distribution in the stack considerably. The influence of the nickel mesh on the total catalytic methane conversion is the subject of this work. In the stack assembly of the solid oxide fuel cell (esp. the sealing step) a nickel mesh is installed between the substrate (NiO/8YSZ not yet reduced) and the profiled interconnect (1.4742 steel). The sealing process in stack assembly is carried out in air at 1173 K. The nickel mesh is superficially oxidized and reduced again when starting and operating the stack. SEM studies on surfaces of the nickel mesh reveal that surface structures are generated which exhibit greater roughness and addnl. porosity in comparison to untreated nickel mesh. Catalytic studies on the activity for methane steam reforming show that surface-oxidized and subsequently reduced nickel mesh catalyzes more strongly by a factor of two than untreated nickel mesh. The contribution to total methane steam reforming caused by the nickel mesh amts. to approx. 7% for a substrate anode 1.5 mm in thickness with 40% porosity at 1188 K, to approx. 5% at 1123 K and just approx. 1% at 1023 K (refer to anode substrate = 100%). Considering the area available in the stack, this leads to the conclusion that methane steam reforming by the nickel mesh above 1123 K is sufficient to supply the stack with sufficient H₂ and CO.

Keywords

methane steam reforming catalyst nickel mesh
fuel cell methane steam reforming catalyst

Index Entries

Fuel cell anodes
Solid state fuel cells
Steam reforming catalysts
properties of nickel mesh as methane steam reforming catalyst
and its application in solid oxide fuel cells
12597-69-2, uses
1.4742, interconnect; properties of nickel mesh as methane steam
reforming catalyst and its application in solid oxide fuel
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7440-02-0, uses
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74-82-8, reactions
630-08-0, preparation
1333-74-0, uses
properties of nickel mesh as methane steam reforming catalyst
and its application in solid oxide fuel cells
1314-23-4, uses
yttria-stabilized; properties of nickel mesh as methane steam
reforming catalyst and its application in solid oxide fuel
cells
1314-36-9, uses
zirconia stabilized with; properties of nickel mesh as methane
steam reforming catalyst and its application in solid oxide
fuel cells

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131:169946
Supramolecules having inner pore. Chemistry of new isolated space.
Fujita, Makoto; Kusakawa, Takahiro; Aoyagi, Masaru (Grad. Sch. Eng.,
Nagoya Univ., Nagoya 464-8603, Japan). Kagaku to Kogyo (Tokyo),
52(8), 959-963 (Japanese) 1999 Nippon Kagakkai. CODEN:
KAKTAF. ISSN: 0022-7684. DOCUMENT TYPE: Journal; General
Review CA Section: 22 (Physical Organic Chemistry) Section
cross-reference(s): 28, 67, 78
A review with 14 refs. on the construction of macromol. 3-dimensional
structures having internal pores by self-assembly, and specific
functions and reactions in their internal space, including incorporation
of carboranes, catalytic reactions in Pd complexes, self-assembly of
nanotubes, and self-assembly of mol. capsules from 24 components.

Keywords

review self assembly inclusion supramol
palladium complex supramol catalyst assembly review

Index Entries

Addition reaction catalysts
Pd complex supramols.; self-assembly and reactions of
supramols. having internal space
Inclusion reaction
Self-assembly
Supramolecular structure
self-assembly and reactions of supramols. having internal space
7440-05-3, supramol. complexes
self-assembly and reactions of supramols. having internal space

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131:118182

Support-pore architecture optimization in FCC catalyst particles using designed pore networks.

El-Nafaty, U. A.; Mann, R. (Department of Chemical Engineering, UMIST, Manchester M60 1QD, UK). Chem. Eng. Sci., 54(15-16), 3475-3484 (English) 1999 Elsevier Science Ltd. CODEN: CESCAC. ISSN: 0009-2509. DOCUMENT TYPE: Journal CA Section: 51 (Fossil Fuels, Derivatives, and Related Products)

SEM images of FCC catalyst particles reveal the internal pore space to consist of massive networks of randomly interconnected pores of varying sizes and orientation. Until recently, design of catalyst particles has been restricted mainly to compn., particle size and pore size distribution with little attention paid to pore architecture. With recent advances in computing technol. and catalyst characterization techniques it is now possible to move from these "jumbled" configurations towards more structured controlled pore architectures that could greatly enhance effective utilization of catalyst pore space. In this paper, an application of 2D stochastic networks to investigate the direct influence of pore assembly on diffusion and reaction in FCC catalyst particles is described. Coke burn-off in heavily coked particles was used. Various pore architectural structures were tested including random, pos. spiralled, neg. spiralled, structured and interspersed 2D networks. The interspersed network exhibited fastest burn-off kinetics relative to other structures while the random configuration, which probably characterizes most current catalyst particles, showed results better only than the neg. spiralled network. This can be attributed to enhanced reactant accessibility resulting from absence of transport inefficient micro- and macro-pore clusters and an increase in direct micro-macro pore links characteristic of the designed interspersed network.

Keywords

petroleum cracking catalyst pore architecture

Index Entries

Petroleum cracking catalysts

Pore structure

support-pore architecture optimization in FCC catalyst particles using designed pore networks

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131:76203

Hydrogen catalysis power cell for energy conversion systems.

Mills, Randell L.; Good, William R.; Kendall, James M. (Black Light Power, Inc., USA). PCT Int. Appl. WO 9935698 A2 15 Jul 1999, 49 pp.

DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG.

(English). (World Intellectual Property Organization). CODEN: PIXXD2.

CLASS: ICM: H01M. APPLICATION: WO 1998-US22822 28 Oct

1998. PRIORITY: US 1997-63451 29 Oct 1997. DOCUMENT TYPE:

Patent CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 48

An energy conversion system is provided for generating heat based on hydrogen catalysis and for transferring the generated heat to a working

fluid and utilizing the heat or converting it to mech. or elec. energy. The energy conversion system comprises a hydrogen catalysis power cell, the power cell comprising a heat transfer assembly having at least one reaction chamber contg. the means to dissoc. mol. hydrogen gas to at. hydrogen and a delivery assembly connected in fluid communication to the reaction chamber for delivering hydrogen gas and vaporous catalyst for hydrogen catalysis. The delivery assembly comprises a catalyst vessel for generating the vaporous catalyst, a source of hydrogen gas, and a semi-permeable membrane assembly connected in fluid communication with the hydrogen gas source and the heat transfer assembly. The power cell further comprises means for regulating the temp. of the catalyst vessel and means for regulating the temp. surrounding the semi-permeable membrane. An energy conversion system is also provided having a hydrogen catalysis power cell as described herein, a working fluid for receiving the heat released from hydrogen catalysis, means for converting the heat in the working fluid to mech. or elec. energy, and preferably means to balance the heat removed by the working fluid with the energy produced by hydrogen catalysis.

Keywords

energy conversion hydrogen catalysis power cell
heat generation hydrogen catalysis power cell

Index Entries

Catalysis
Dissociation catalysts
Energy
Heat
Heat transfer
Membranes (nonbiological)
Power generation
hydrogen catalysis power cell for energy conversion systems
Energy
mech.; hydrogen catalysis power cell for energy conversion systems
7440-25-7, uses
Pd-coated; hydrogen catalysis power cell for energy conversion systems
7440-05-3, uses
Ta coated with; hydrogen catalysis power cell for energy conversion systems
7681-11-0, uses
1333-74-0, uses
hydrogen catalysis power cell for energy conversion systems

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131:45934

Thixotropic polyurethane elastomeric filler and/or adhesive and method for filling/strengthening a seam of a panel assembly therewith.

Merser, N. Keith; Tanis, Rick A.; Hyde-Smith, Peter K. (ITW Foamseal (a Division of Paslode Corporation), USA). Can. Pat. Appl. CA 2206499 AA 1 Jan 1998, 46 pp. (English). (Canada). CODEN: CPXXEB. CLASS: ICM: C09J175-04. ICS: B05D003-12.

APPLICATION: CA 97-2206499 29 May 1997. PRIORITY: US

96-673571 1 Jul 1996. DOCUMENT TYPE: Patent CA Section: 39

(Synthetic Elastomers and Natural Rubber) Section cross-reference(s): 38, 42

The thixotropic elastomeric material is prepd. by rapidly mixing and initiating the reaction of a first thixotropic component comprising an isocyanate-terminated compd. having at least two reactive isocyanate groups and a second thixotropic component comprising a

hydroxyl-terminated compd. having at least two reactive hydroxyl groups. Each of the first and second thixotropic components include ~3-8 wt.% fumed silica. The second thixotropic component also includes ~10-50% filler. The nonfoaming, thixotropic elastomeric material is applied over a seam, opening, or void of a panel assembly, fluidized, driven into the seam, and allowed to cure. Thus, a thixotropic isocyanate component comprising treated fumed silica 6.0, Rubinate M 78.3, and Poly-G 20-112 15.7 parts and a thixotropic hydroxy component comprising Poly-G 20-56 48.925, Multranol 9138 14.0, Coscat 83 catalyst 0.075, Baylith L moisture scavenger 2.0, TiO₂ in a polyether polyol 5.0, Wollastokup 10012 25.0, and treated fumed silica 5.00 parts were mixed in a dispensing gun and dispensed over a seam. A putty knife is slid along the seam, scraping off a small portion of the elastomer while driving the major portion into the seam, leaving a smooth exposed seam surface that can be sanded and painted after curing.

Keywords

thixotropic urethane rubber building filler caulk
panel assembly thixotropic urethane rubber adhesive

Index Entries

Urethane rubber, preparation
polyether-, block; thixotropic polyurethane elastomeric filler and/or adhesive and method for filling/strengthening a seam of a panel assembly therewith
Adhesives
Boards
Caulking compositions
Gypsum boards
Thixotropic materials
Urethane rubber, preparation
thixotropic polyurethane elastomeric filler and/or adhesive and method for filling/strengthening a seam of a panel assembly therewith
7631-86-9, uses
colloidal; thixotropic polyurethane elastomeric filler and/or adhesive and method for filling/strengthening a seam of a panel assembly therewith
13983-17-0
filler; thixotropic polyurethane elastomeric filler and/or adhesive and method for filling/strengthening a seam of a panel assembly therewith
227016-60-6
227200-20-6
227200-21-7
13463-67-7, uses
thixotropic polyurethane elastomeric filler and/or adhesive and method for filling/strengthening a seam of a panel assembly therewith

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130:239897

Sputter-deposited fuel cell membranes and electrodes.

Narayanan, Sekharipuram R.; Jeffries-Nakamura, Barbara; Chun, William; Ruiz, Ron P.; Valdez, Thomas I. (California Institute of Technology, USA). PCT Int. Appl. WO 9916137 A1 1 Apr 1999, 34 pp.

DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ,

MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). (World Intellectual Property Organization).

CODEN: PIXXD2. CLASS: ICM: H01M004-88. ICS: C23C014-00.

APPLICATION: WO 98-US19838 22 Sep 1998. PRIORITY: US

97-59472 22 Sep 1997. DOCUMENT TYPE: Patent CA Section: 52

(Electrochemical, Radiational, and Thermal Energy Technology)

Section cross-reference(s): 67

A method for prepg. a membrane for use in a fuel cell electrode assembly includes the steps of providing an electrolyte membrane, and sputter-depositing a catalyst onto the electrolyte membrane. The sputter-deposited catalyst may be applied to multiple sides of the membrane. A method for forming an electrode for use in a fuel cell membrane electrode assembly includes the steps of obtaining a catalyst, obtaining a backing, and sputter depositing the catalyst onto the backing. In the sputtering operation, the electrolyte membrane or the backing forms a substrate, while the catalyst is deposited from a target. The membranes and electrodes are useful for assembling fuel cells that include an anode, a cathode, a fuel supply, and an electrolyte membrane, wherein the membrane includes a sputter-deposited catalyst, which is effective for sustaining a voltage across a membrane electrode assembly of the fuel cell.

Keywords

fuel cell membrane electrode sputter deposition
hydrogen fuel cell membrane sputter deposition
methanol fuel cell membrane sputter deposition

Index Entries

Polyoxyalkylenes, uses
fluorine- and sulfo-contg., ionomers; sputter-deposited fuel cell membranes and electrodes
Fluoropolymers, uses
polyoxyalkylene-, sulfo-contg., ionomers; sputter-deposited fuel cell membranes and electrodes
Ionomers
polyoxyalkylenes, fluorine- and sulfo-contg.; sputter-deposited fuel cell membranes and electrodes
Electrocatalysts
Fuel cell anodes
Fuel cell cathodes
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7440-32-6, uses
7440-33-7, uses
7440-67-7, uses
12036-10-1

12779-05-4
 18282-10-5
 66796-30-3
 67-56-1, uses
 1333-74-0, uses
 sputter-deposited fuel cell membranes and electrodes

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131:339422

Modeling of the effect of MEA microstructure on the performance of proton exchange membrane fuel cells.

Malhotra, Sanjiv; Thampan, Tony; Datta, Ravindra (H Power corp., Belleville, NJ 07109, USA). Proc. - Electrochem. Soc., 99-13(Solid-State Ionic Devices), 256-267 (English) 1999 Electrochemical Society. CODEN: PESODO. ISSN: 0161-6374.

DOCUMENT TYPE: Journal CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section

cross-reference(s): 38

The aim of this paper is the development of a theor. model that can shed further light on the design and operational factors of the MEA (membrane electrode assembly) that affects the performance of a proton exchange membrane. Details are given on proton exchange membrane fuel cell structure, catalyst layer microstructure, electrode kinetics and current densities, H electrode reaction, transport of gases in the gas diffusion backing, transport in the proton exchange membrane, and MEA anal.

Keywords

proton exchange membrane fuel cell performance
 modeling membrane electrode assembly microstructure

Index Entries

Polyoxyalkylenes, uses

fluorine- and sulfo-contg., ionomers; modeling of effect of membrane electrode assembly microstructure on performance of proton exchange membrane fuel cells

Fuel cells

Microstructure

Simulation and Modeling, physicochemical

modeling of effect of membrane electrode assembly microstructure on performance of proton exchange membrane fuel cells

Fluoropolymers, uses

polyoxyalkylene-, sulfo-contg., ionomers; modeling of effect of membrane electrode assembly microstructure on performance of proton exchange membrane fuel cells

Ionomers

polyoxyalkylenes, fluorine- and sulfo-contg.; modeling of effect of membrane electrode assembly microstructure on performance of proton exchange membrane fuel cells

66796-30-3

modeling of effect of membrane electrode assembly microstructure on performance of proton exchange membrane fuel cells

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131:32390

Self-Assembled Inverted Micelles Prepared from a Dendrimer

Template: Phase Transfer of Encapsulated Guests.

Chechik, Victor; Zhao, Mingqi; Crooks, Richard M. (Department of Chemistry, Texas A&M University, College Station, TX 7842-3012,

USA). J. Am. Chem. Soc., 121(20), 4910-4911 (English) 1999
 American Chemical Society. CODEN: JACSAT. ISSN: 0002-7863.
 DOCUMENT TYPE: Journal CA Section: 36 (Physical Properties of
 Synthetic High Polymers) Section cross-reference(s): 66, 67
 A spontaneous assembly of fatty acids onto the surface of
 amine-terminated poly(amidoamine) dendrimers is described. This
 process, which is driven by acid-base chem. and ion pairing, results in
 the extn. of dendrimers from aq. solns. to nonpolar phases. In
 dodecanoic acid-contg. toluene solns., the acid mols. arrange
 themselves around the dendrimer in a composite structure that
 resembles an inverted micelle with a hydrophilic dendritic interior and a
 hydrophobic alkyl-chain-dominated exterior. The
 dendrimer/dodecanoic acid system was successfully employed to
 transfer methyl orange from an aq. soln. to toluene contg. dodecanoic
 acid. Also, dendrimer-encapsulated Pd nanoparticle catalysts were
 prepd. and tested for allyl alc. hydrogenation.

Keywords

self assembly dodecanoic acid polyamidoamine dendrimer reverse
 micelle
 encapsulation self assembled dodecanoic acid polyamidoamine
 dendrimer reverse micelle
 catalyst self assembled dodecanoic acid polyamidoamine dendrimer
 reverse micelle

Index Entries

Polyamines (polymeric)
 dendrimers; self-assembly of inverted micelles prepd. from
 poly(amidoamine) dendrimer and dodecanoic acid
 Hydrogenation catalysts
 Microencapsulation
 Nanoparticles
 encapsulation of palladium nanoparticle catalysts using
 self-assembled inverted micelles prepd. from dendrimer
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 polyamines; self-assembly of inverted micelles prepd. from
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 Self-assembly
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 26937-01-9
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 547-58-0
 encapsulation and transfer of methylene orange to toluene phase
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 143-07-7, processes
 7440-05-3, processes
 encapsulation of palladium nanoparticle catalysts using
 self-assembled inverted micelles prepd. from dendrimer
 template

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131:19228

Self-assembled ionophores as phase transfer catalysts.
 Marlow, Allison L.; Davis, Jeffery T. (Department of Chemistry and
 Biochemistry, University of Maryland at College Park, College Park,
 MD 20742, USA). Tetrahedron Lett., 40(18), 3539-3542 (English)
 1999 Elsevier Science Ltd. CODEN: TELEAY. ISSN: 0040-4039.

DOCUMENT TYPE: Journal CA Section: 33 (Carbohydrates)

The nucleoside, 5'-(t-butyl-dimethylsilyl)-2',3'-O-isopropylidene isoG I [R = Me₂(Me₃C)Si], catalyzes the SN₂ reactions of alkali and ammonium iodides with dodecyl mesylate under both liq.-liq. and solid-liq. phase transfer conditions. I self-assocs. to give a complex that exts. the salts into CDCl₃ soln. Sodium iodide, in the presence of I, reacts faster with dodecyl mesylate than the other iodides under solid-liq. conditions. The reactivity difference between metal iodides is attributed to the open-faced structure of the ionophore-metal cation complex under solid-liq. conditions.

Keywords

nucleoside nucleophilic displacement catalyst
phase transfer catalyst dodecyl mesylate nucleophilic displacement
metal iodide
assocn nucleoside alkali metal cation
self assembled ionophore phase transfer catalyst

Index Entries

Phase transfer catalysts

Self-assembly

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7440-23-5, tert-butyldimethylsilyl-2',3'-O-isopropylideneisoguanosine, self-assembled decamer, pentamer, and tetramer complexes
165257-93-2, self-assembled decamer, pentamer, and tetramer complexes with sodium (1+)
a protected nucleoside as a phase transfer catalyst by metal cation complexation with self-assembled hydrogen-bonded nucleoside complexes
165257-93-2
7681-11-0, reactions
7681-82-5, reactions
7789-17-5
7790-29-6
12027-06-4
51323-71-8
4292-19-7
a protected nucleoside as a phase transfer catalyst for nucleophilic displacement of dodecyl mesylate by iodides to give dodecyl iodide by metal cation complexation with self-assembled hydrogen-bonded nucleoside complexes
10377-51-2
a protected nucleoside as an ineffective phase transfer catalyst for nucleophilic displacement of dodecyl mesylate by lithium iodide by metal cation complexation with self-assembled hydrogen-bonded nucleoside complexes

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130:27169

Performance modeling in a lightweight fuel cell stack.
Polevaya, O.; Bloomfield, D. (USA). Proc. Power Sources Conf., 38th, 416-419 (English) 1998 National Technical Information Service.
CODEN: PPOCFD. DOCUMENT TYPE: Journal CA Section: 52
(Electrochemical, Radiational, and Thermal Energy Technology)
A performance model of a lightwt. fuel cell stack, utilizing a strip cell conduction design is presented. In the strip design an expanded metal current collector screen is impressed into a proton exchange membrane. The current collector/membrane assembly is catalyzed on

both sides. The cells are heat bonded together, the anode of one cell extending to form the cathode of the next cell. The resulting planar strip of cells is capable of producing a high voltage in a small vol. Planar strip cells are stacked to obtain high power levels and high voltages. The reactants are sepd. by pseudo-bipolar plates which are fabricated from thin plastic sheets. Strip cell electron flow is restricted to the cell plane, as opposed to conventional bipolar cells where current flow is perpendicular to the cell plane. Current generation in the catalyst and transmission in the current collector is quite complex. The strip cell surface is not equipotential. The electrons formed in the catalyst are forced to move in the catalyst plane towards the current collector screen. Catalyst layer electronic cond. is very important. Swelling of the proton exchange membrane coupled with low catalyst compression can result in cracks between the catalyzed membrane and the current collector screen, thus impeding current collection. Our present understanding of the cell is based on performance modeling and exptl. resistance measurements. We have used current interrupter, a.c. impedance and electrochem. compression methods to obtain cell resistance. We have also modeled the water transport in the cell. Water management affects the resistance of the membrane and, through membrane swelling, catalyst layer structural stability. The goal performance is 0.7 V at 40 mA/cm². We have detd. that the way to reach this goal is to improve the catalyst/membrane/current collector interface.

Keywords

modeling fuel cell stack performance

Index Entries

Fuel cells

modeling of performance of lightwt. fuel cell stacks

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131:336853

The synthesis and evaluation of 12,13-benzodesoxyepothilone B: a highly convergent route.

Glunz, Peter W.; He, Lifeng; Horwitz, Susan B.; Chakravarty, Subrata; Ojima, Iwao; Chou, Ting-Chao; Danishefsky, Samuel J. (Laboratory for Bioorganic Chemistry, Sloan-Kettering Institute for Cancer Research, New York, NY 10021, USA). Tetrahedron Lett., 40(38), 6895-6898 (English) 1999 Elsevier Science Ltd. CODEN: TELEAY. ISSN: 0040-4039. DOCUMENT TYPE: Journal CA Section: 26 (Biomolecules and Their Synthetic Analogs)

The title compd. I retains some of the affinity for microtubule assemblies as does 12,13-desoxyepothilone B (II).

Keywords

benzodesoxyepothilone B synthesis biol evaluation
microtubule assembly affinity benzodesoxyepothilone B
desoxyepothilone B analog synthesis biol evaluation

Index Entries

Microtubule

assembly affinity; synthesis and affinity for microtubule assembly of 12,13-benzodesoxyepothilone B

Tubulins

binding; synthesis and affinity for microtubule assembly of 12,13-benzodesoxyepothilone B

Antitumor agents

Cytotoxicity
 synthesis and affinity for microtubule assembly of
 12,13-benzodesoxyepothilone B
 189453-10-9, analog
 246529-73-7
 72287-26-4
 121257-85-0, catalyst
 40400-13-3
 112022-83-0
 184246-38-6
 224580-52-3
 246529-69-1
 246529-70-4
 246529-71-5
 246529-72-6
 246530-10-9
 246530-11-0
 246530-12-1
 246530-13-2
 246530-14-3
 250131-98-7
 250132-00-4
 synthesis and affinity for microtubule assembly of
 12,13-benzodesoxyepothilone B

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130:327173
 Fabrication technology of membrane electrode assembly and the
 electrocatalyst for PEMFC.
 Ma, Zifeng; Huang, Bichun; Shi, Yumei (Institute of Fuel Cell, Shanghai
 Jiao Tong University, Shanghai 200030, Peop. Rep. China). Dianyuan
 Jishu, 23(2), 149-153 (Chinese) 1999 Dianyuan Jishu Bianjibu.
 CODEN: DIJIFT. ISSN: 1002-087X. DOCUMENT TYPE: Journal;
 General Review CA Section: 52 (Electrochemical, Radiational, and
 Thermal Energy Technology) Section cross-reference(s): 72
 One of the main barrier for the commercialization of PEMFC is the high
 cost to the electrocatalyst. The research on the platinum and the
 substitution of platinum electrocatalyst for the electrode of PEMFCs
 has been reviewed with 37 refs. The electrocatalytic activity was
 affected by the particle size and surface functional group. The activity
 of synergistic system in electrocatalysis is more effective than that of
 material alone. The performance of membrane electrode assembly
 (MEA) has a direct bearing on its prepn. technique. The anal. results
 show that it is important to obtain a high catalyst utilization during the
 commercialization process of the PEMFC technol. High utilization of
 the precious metal catalysts can be achieved by obtaining the highest
 possible surface to vol. ratio of the dispersed metal. The catalyst
 utilization is interrelated with particle size of precious metal and the
 fabrication technique of membrane electrode assembly.

Keywords

review fuel cell membrane electrode assembly

Index Entries

Electrocatalysts
 Fuel cell electrodes
 Fuel cell electrolytes
 Fuel cells
 fabrication technol. of membrane electrode assembly and
 electrocatalyst for polymer electrolyte membrane fuel cell

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130:281924

On the absence of stereoselectivity in the catalytic oxidation of alkenes with a surface-bound metalloporphyrin-peptide conjugate.

Geier, G. Richard, III; Lybrand, Terry P.; Sasakia, Tomikazu
(Department of Chemistry, University of Washington, Seattle, WA
98195-1700, USA). Tetrahedron, 55(7), 1871-1880 (English) 1999
Elsevier Science Ltd. CODEN: TETRAB. ISSN: 0040-4020.

DOCUMENT TYPE: Journal CA Section: 27 (Heterocyclic Compounds
(One Hetero Atom)) Section cross-reference(s): 26, 34

As reported in the proceeding paper, the catalytic oxidn. of alkene substrates using a novel surface-bound metalloporphyrin-peptide conjugate catalyst occurred largely in accord with the catalyst design. Yet despite the regulation of many aspects of the oxidn., the asym. conjugate catalyst did not oxidize substrates stereoselectively. The absence of stereoselective catalysis is considered here through examn. of potential exptl. problems (improper surface assembly and catalyst degrdn.) and potential design problems (binding pocket symmetry and peptide packing). Neither exptl. issue was shown to be the definitive problem. Mol. modeling of the catalyst suggested the binding pocket was too sym.

Keywords

oxidn olefin metalloporphyrin peptide conjugate silica
stereochem oxidn olefin metalloporphyrin peptide conjugate
modeling metalloporphyrin peptide conjugate oxidn catalyst

Index Entries

Molecular modeling
Oxidation catalysts
Stereochemistry
Epoxides

absence of stereoselectivity in catalytic oxidn. of alkenes with
surface-bound metalloporphyrin-peptide conjugate

Aromatic hydrocarbons, reactions

aryl alkenes; absence of stereoselectivity in catalytic oxidn. of
alkenes with surface-bound metalloporphyrin-peptide
conjugate

Alkenes, reactions

aryl; absence of stereoselectivity in catalytic oxidn. of alkenes with
surface-bound metalloporphyrin-peptide conjugate

222640-08-6

222640-08-6, imidazolylpropylated silica gel supported
absence of stereoselectivity in catalytic oxidn. of alkenes with
surface-bound metalloporphyrin-peptide conjugate

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130:252340

Organic "Magic Rings": The Hydrogen Bond-Directed Assembly of
Catenanes under Thermodynamic Control.

Kidd, Timothy J.; Leigh, David A.; Wilson, Andrew J. (Department of
Chemistry, University of Manchester Institute of Science and
Technology, Manchester M60 1QD, UK). J. Am. Chem. Soc., 121(7),
1599-1600 (English) 1999 American Chemical Society. CODEN:
JACSAT. ISSN: 0002-7863. DOCUMENT TYPE: Journal CA Section:
28 (Heterocyclic Compounds (More Than One Hetero Atom))

Macrocycles I (R = H, BuCH(Et)CH₂O) undergo ring opening-ring
closing metathesis reactions in the presence of Grubbs'
benzylideneruthenium metathesis catalyst (Cy₃P)₂Ru(:CHPh)Cl
directed by hydrogen bonds between amide hydrogens and carbonyl
groups to give thermodyn. formation of catenanes in >95% yield.

Catenanes formed from I quant. reverted to I upon either diln. in the presence of metathesis catalyst, or by addn. of trifluoroacetic anhydride to break the hydrogen bonds followed by addn. of metathesis catalyst and hydrolysis of the trifluoroacetyl groups in methanol. Hydrogen bonding and the presence of metathesis catalyst control the equil. between the catenanes and their macrocyclic monomers in soln.

Keywords

catenane prepn
 macrocyclic amide prepn
 thermodyn control hydrogen bond directed assembly catenane
 ring opening closing metathesis macrocyclic amide alkene Grubbs
 catalyst
 reversion catenane macrocycle concn inhibition hydrogen bonding
 trifluoroacetylation amide
 org magic ring prepn

Index Entries

Macrocyclic compounds

alkene; prepn. in the synthesis of catenanes by hydrogen-bond
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 reversible dissocn. to macrocyclic alkenes by diln. or
 reversible trifluoroacetylation

Hydrogen bond

Metathesis

Catenanes

prepn. in the synthesis of catenanes by hydrogen-bond directed
 olefin metathesis of macrocyclic alkenes and reversible
 dissocn. to macrocyclic alkenes by diln. or reversible
 trifluoroacetylation

175689-88-0

221529-51-7

catenane dimer prepd. by hydrogenation; prepn. in the synthesis of
 catenanes by hydrogen-bond directed olefin metathesis of
 macrocyclic alkenes and reversible dissocn. to macrocyclic
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221529-44-8

dimeric catenane prepd. by metathesis of ns monomer, sepd. by
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 hydrogen-bond directed olefin metathesis of macrocyclic
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221529-38-0

221529-40-4

macrocyclic and catenated dimer; prepn. in the synthesis of
 catenanes by hydrogen-bond directed olefin metathesis of
 macrocyclic alkenes and reversible dissocn. to macrocyclic
 alkenes by diln. or reversible trifluoroacetylation

99-63-8

618-83-7

767-00-0

6066-82-6

696-60-6

13036-02-7

35416-68-3

39516-91-1

54653-25-7

175689-87-9

221529-28-8

221529-32-4

221529-34-6

221529-36-8

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221529-48-2
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221529-42-6
trifluoroacetylated dimer; prepn. in the synthesis of catenanes by
hydrogen-bond directed olefin metathesis of macrocyclic
alkenes and reversible dissocn. to macrocyclic alkenes by
diln. or reversible trifluoroacetylation

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130:116423

Current efficiency for soybean oil hydrogenation in a solid polymer
electrolyte reactor.

An, W.; Hong, J.-K.; Pintauro, P. N. (Department of Chemical
Engineering, Tulane University, New Orleans, LA 70118, USA). J.
Appl. Electrochem., 28(9), 947-954 (English) 1998 Chapman & Hall.
CODEN: JAELEBJ. ISSN: 0021-891X. DOCUMENT TYPE: Journal
CA Section: 72 (Electrochemistry) Section cross-reference(s): 17, 38,
67

Soybean oil was hydrogenated electrocatalytically in a solid polymer
electrolyte (SPE) reactor, similar to that in H₂/O₂ fuel cells, with water as
the anode feed and source of hydrogen. The key component of the
reactor was a membrane electrode assembly (MEA), composed of a
precious metal-black cathode, a RuO₂ powder anode, and a Nafion
117 cation-exchange membrane. The SPE reactor was operated in a
batch recycle mode at 60° and one atm. pressure using a com.-grade
soybean oil as the cathode feed. Various factors that might affect the
oil hydrogenation current efficiency were studied, including the type of
cathode catalyst, catalyst loading, the cathode catalyst binder
loading, c.d., and reactant flow rate. The current efficiency ordering of
different cathode catalysts is Pd > Pt > Rh > Ru > Ir. Oil hydrogenation
current efficiencies with a Pd-black cathode decreased with increasing
c.d. and ranged from ~70% at 0.050 A cm⁻² to 25% at 0.490 A cm⁻².
Current pulsing for frequencies at 0.25-60 Hz had no effect on current
efficiencies. The optimum cathode catalyst loading for both Pd and Pt
was 2.0 mg cm⁻². Soybean oil hydrogenation current efficiencies was
unaffected by Nafion and PTFE cathode catalyst binders, as long as
the total binder content was ≤30% (based on the dry catalyst wt.).
When the oil feed flow rate was increased from 80 to 300 mL min⁻¹, the
oil hydrogenation current efficiency at 0.100 A cm⁻² increased from
60% to 70%. A high (70%) current efficiency was achieved at 80 mL
min⁻¹ by inserting a nickel screen turbulence promoter into the oil
stream.

Keywords

current efficiency soybean oil hydrogenation solid polymer electrolyte
reactor
noble metal electrocatalyst soybean oil hydrogenation

Index Entries

Binders

Nafion and PTFE for platinum metal electrocatalysts for soybean oil
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Electrochemical hydrogenation
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Fluoropolymers, uses
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 Soybean oil
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 Platinum-group metals
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 Hydrogenation catalysts
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 metal electrocatalysts for soybean oil hydrogenation
 Membrane cells
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 Current efficiency
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 66796-30-3
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 7439-88-5, uses
 7440-05-3, uses
 7440-06-4, uses
 7440-16-6, uses
 7440-18-8; uses
 electrocatalyst for soybean oil hydrogenation in solid polymer
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 1333-74-0, properties
 electrogeneration in membrane cell for hydrogenation of soybean
 oil

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130:106857

Catalytic Activity of Ni(II)-Terpyridine Complex in Phosphodiester
 Transesterification Remarkably Enhanced by Self-Assembly of
 Terpyridines on Poly(ethylenimine).
 Suh, Junghun; Hong, Sang Hyun (Department of Chemistry and Center
 for Molecular Catalysis, Seoul National University, Seoul 151-742, S.
 Korea). J. Am. Chem. Soc., 120(48), 12545-12552 (English) 1998
 American Chemical Society. CODEN: JACSAT. ISSN: 0002-7863.
 DOCUMENT TYPE: Journal CA Section: 7 (Enzymes)
 To enhance the catalytic activity of metal-terpyridyl complexes toward
 transesterification of an RNA model [(2-hydroxypropyl)-p-nitrophenyl
 phosphate, HPNPP], the conformation of terpyridyl moieties
 assembled on poly(ethylenimine) (PEI) is optimized by attaching the
 Ni(II) complex of a terpyridyl deriv. (NiIITP) and lauryl (Lau) group to PEI
 in random combinations. The catalytic activity per Ni(II) center for
 transesterification of HPNPP varies by up to several thousand times

depending on pH as the content of NiIITP or Lau is changed. The best catalyst obtained is [NiIITP]5Lau12PEI, in which the contents of NiIITP and Lau are 5 and 12 residue mol %, resp. The catalytic activity of [NiIITP]5Lau12PEI expressed in terms of kcat is much higher than those of previously reported binuclear metal complexes whose structures were designed through deliberate planning. In the PEI derivs. contg. NiIITP and Lau, several NiIITP groups can be positioned in proximity in the hydrophobic clusters formed on the polymer. When the NiIITP groups take productive positions, the two phosphoryl-oxygen bonds and the hydroxyl group of HPNPP can be effectively activated. Thus, artificial active sites comprising multiple catalytic groups are obtained by self-assembly of the catalytic groups. Moreover, cooperative action among the catalytic groups is optimized through combinatorial approach.

Keywords

RNA transesterification artificial nuclease self assembly

Index Entries

Self-assembly

Transesterification (biological)

RNA

catalytic activity of Ni(II)-terpyridine complex in phosphodiester transesterification remarkably enhanced by self-assembly of terpyridines on poly(ethylenimine)

1148-79-4

89972-77-0

89972-78-1

110975-15-0

164987-73-9

164987-75-1

219607-60-0

219649-97-5

219649-98-6

4281-46-3

9002-98-6

catalytic activity of Ni(II)-terpyridine complex in phosphodiester transesterification remarkably enhanced by self-assembly of terpyridines on poly(ethylenimine)

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130:103778

Materials for semiconductor device assemblies.

Chau, Michael M.; Burkhardt, Donald A. (Johnson Matthey, Inc., USA).

U.S.. US 5855821 A 5 Jan 1999, 6 pp. (English). (United States of

America). CODEN: USXXAM. CLASS: ICM: H01B001-22. ICS:

C08K003-34; C08K003-36. NCL: 252514000. APPLICATION: US

1995-577256 22 Dec 1995. DOCUMENT TYPE: Patent CA Section:

76 (Electric Phenomena)

A compn. suitable for use as an underfill for an interconnection between a semiconductor device and a substrate, as a semiconductor device encapsulant, a dam, an adhesive for direct chip attachment, and as an elec. connection for a semiconductor device and a substrate is described. The compn. contains ~40-90% of an elec. conductive or nonconductive filler and a cyanate ester and epoxy resin component. The cyanate ester/epoxy resin component comprises ~10-70% cyanate ester material, ~30-90% epoxy resin, ~0.1-1.5% metal chelate/amine solid curing catalyst and ~0.1-5% coupling agent.

Keywords

semiconductor device assembly compn

interconnection compn semiconductor device
encapsulant compn semiconductor device
chip attachment adhesive compn semiconductor device
cyanate ester contg compn semiconductor device assembly
epoxy resin contg compn semiconductor device assembly
metal chelate amine catalyst semiconductor device assembly compn
coupling agent contg compn semiconductor device assembly
packaging semiconductor device

Index Entries

Epoxy resins, uses
bisphenol-based; compns. for semiconductor device assemblies
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Electronic packaging materials
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curing catalysts and coupling agents
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Semiconductor devices
compns. for semiconductor device assemblies
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compns. for semiconductor device assemblies contg. conductive
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Fillers
compns. for semiconductor device assemblies contg. conductive or
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chelate/amine curing catalysts
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Encapsulants
compns. for use as encapsulants in semiconductor device
assemblies
Interconnections (electric)
compns. for use as underfill for interconnections in semiconductor
device assemblies
1025-15-6
25154-52-3
153891-06-6
compns. for semiconductor device assemblies contg.
108-95-2, alkyl derivs.
13395-16-9
21679-46-9
compns. for semiconductor device assemblies having curing
catalysts contg.
471-34-1, uses
1344-28-1, uses
7440-22-4, uses
7631-86-9, uses
10043-11-5, uses
10101-52-7
12033-89-5, uses
24304-00-5
compns. for semiconductor device assemblies having fillers contg.

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130:56358

Device for installation of catalyst modules.
Stocksiefen, Karl Heinz; Eberle, Hans-juergen (Consortium Fuer Elektrochemische Industrie G.m.b.H, Germany). Ger. Offen. DE 19723668 A1 10 Dec 1998, 8 pp. (German). (Germany). CODEN: GWXXBX. CLASS: ICM: B01J035-00. ICS: B01J035-04; B01D053-88; B01D053-94; F23G007-06. APPLICATION: DE 97-19723668 5 Jun 1997. DOCUMENT TYPE: Patent CA Section: 59 (Air Pollution and Industrial Hygiene) Section cross-reference(s): 67
The waste gas catalyst modules are supported in a metal frame; the frames have springs which maintain the correct distance between modules. The metal framing and spring assembly is screened from the waste gases. The modules allow rapid exchange of catalyst and are use for afterburning catalysts in which the gases are mixed with air and fed over the catalyst bed at 150-500°.

Keywords

module afterburning catalyst

Index Entries

Catalysts

Waste gases

device for installation of catalyst modules

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131:187358

Air depolarized battery having imperforate contact zone on cathode current collector.
Oltman, John Edward (Rayovac Corporation, USA). Eur. Pat. Appl. EP 940873 A2 8 Sep 1999, 73 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). (European Patent Organization). CODEN: EPXXDW. CLASS: ICM: H01M012-06. ICS: H01M004-86; H01M004-88. APPLICATION: EP 1999-301739 8 Mar 1999. PRIORITY: US 1998-77037 6 Mar 1998; US 1998-91384 1 Jul 1998. DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology)
An air depolarized electrochem. cell, having an outer surface, comprises: (a) an anode including electroactive anode material; (b) a cathode, including an air cathode assembly; (c) a grommet juxtaposed in surface-to-surface relationship with the border region of the cathode current collector; (d) a separator between the anode material and the cathode assembly; and (e) electrolyte disbursed in the anode material, the cathode assembly, and the separator. The air cathode assembly comprises a cathode current collector which, optionally, may be configured in a flat sheet-like arrangement, and an active catalyst mounted to the cathode current collector and catalyzing a cathodic reaction with oxygen entering the cell, the air cathode assembly having an active reaction surface, the current collector comprising a central region having perforations therein, and a border region disposed about the central region, the border region having an imperforate portion.

Keywords

battery depolarized metal air

Index Entries

Secondary batteries

Zn-air; air depolarized cell having imperforate contact zone on

cathode current collector
 Battery cathodes
 air depolarized cell having imperforate contact zone on cathode
 current collector

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130:284488

Membrane electrode assemblies.

Debe, Mark K.; Larson, James M.; Balsimo, William V.; Steinbach, Andrew J.; Ziegler, Raymond J. (Minnesota Mining and Manufacturing Company, USA). PCT Int. Appl. WO 9919929 A1 22 Apr 1999, 86 pp.

DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). (World Intellectual Property Organization).

CODEN: PIXXD2. CLASS: ICM: H01M008-10. APPLICATION: WO 98-US18211 2 Sep 1998. PRIORITY: US 97-948627 10 Oct 1997.

DOCUMENT TYPE: Patent CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section

cross-reference(s): 38, 72

Membrane electrode assemblies are described that include an ion conductive membrane, a catalyst adjacent to the major surfaces of the ion conductive membrane and a porous particle filled polymer membrane adjacent to the ion conductive membrane. The catalyst can be disposed on the major surfaces of the ion conductive membrane. Preferably, the catalyst is disposed in nanostructures. The polymer film serving as the electrode backing layer preferably is processed by heating the particle loaded porous film to a temp. within about 20° of the m.p. of the polymer to decrease the Gurley value and the elec. resistivity. The MEAs can be produced in a continuous roll process. The MEAs can be used to produce fuel cells, electrolyzers and electrochem. reactors.

Keywords

membrane electrode assembly fuel cell
 electrolyzer membrane electrode assembly
 electrochem reactor membrane electrode assembly

Index Entries

Polyoxyalkylenes, uses
 fluorine- and sulfo-contg., ionomers; membrane electrode assemblies
 Membranes (nonbiological)
 ion-conductive; membrane electrode assemblies
 Conducting polymers
 Electrocatalysts
 Electrolysis catalysts
 Electrolytic cells
 Fuel cell electrodes
 Fuel cells
 Nanostructures
 Carbon black, uses
 Carbon fibers, uses
 Fluoropolymers, uses
 membrane electrode assemblies
 Fluoropolymers, uses
 polyoxyalkylene-, sulfo-contg., ionomers; membrane electrode assemblies

Ionomers

polyoxyalkylenes, fluorine- and sulfo-contg.; membrane electrode assemblies

7440-06-4, uses

7440-33-7, uses

7440-44-0, uses

7782-42-5, uses

9002-84-0

9002-88-4

9003-07-0

24937-79-9

26655-00-5

66796-30-3

membrane electrode assemblies

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130:147768

Biomimetic assembly of porous lamellar silica molecular sieves with a vesicular particle architecture.

Tanev, Peter T.; Pinnavaia, Thomas J. (Department of Chemistry and Center for Fundamental Materials Research, Michigan State University, East Lansing, MI 48824-1322, USA). Supramol. Sci., 5(3-4), 399-404 (English) 1998 Elsevier Science Ltd. CODEN: SUSCFX. ISSN:

0968-5677. DOCUMENT TYPE: Journal CA Section: 78 (Inorganic

Chemicals and Reactions) Section cross-reference(s): 66

A direct biomimetic assembly approach to the synthesis of lamellar silicas is demonstrated based on the hydrolysis and condensation of a neutral Si alkoxide precursor (TEOS) in the multilamellar regions of vesicle structure directors formed from a neutral diamine bolaamphiphile. The biomimetic nature of the synthetic approach is manifested by the fact that the neutral diamine template functions not only as a framework precursor and supramol. template but also as a multilamellar vesicular nanoreactor governing the direction of framework growth and the particle architecture. In contrast to the bilayer surfactant assembly approaches, which afforded thermally unstable, as-synthesized, lamellar MCM-50 products, this method affords porous lamellar silicas (denoted MSU-V) with vesicular particle architecture, significant thermal stability (up to 800°), a high degree of framework crosslinking and unusually high sp. surface area and pore vol. The MSU-V deriv. assembled from the C12 bolaamphiphile exhibits gallery-confined micropore size of 1.3 nm and properties similar to pillared lamellar materials, but the deriv. prepd. from the longer C18 diamine shows gallery-confined mesopore size of 2.7 nm and sorption properties analogous to MCM-41 mesoporous mol. sieves. Due to the absence of electrostatic surfactant-SiO₂ interactions the neutral template can be subjected to efficient and environmentally benign recovery and recycling from the MSU-V product by simple solvent extn. This approach circumvents the need for a sep. pillaring step in building porosity into a lamellar host structure, and offers new opportunities for the direct fabrication of adsorbents, catalyst supports and nanoscale devices. Because of their simple, 1-step prepn., significant thermal stability and unique sorption properties MSU-V silicas can be expected to augment the pillared lamellar materials and the M41S mesoporous mol. sieves for a no. of adsorption, ion-exchange and catalytic processes.

Keywords

silica mol sieve prepn vesicular particle architecture

Index Entries

Molecular sieves

Vesicles (colloidal)

biomimetic assembly of porous lamellar silica mol. sieves with
vesicular particle architecture

Pore size

Sorption

Surface area

Thermal stability

of porous lamellar silica mol. sieves with vesicular particle
architecture

7631-86-9, preparation

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template for prepn. of porous lamellar silica mol. sieves with
vesicular particle architecture

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130:130975

Electrooxidation of ethylene glycol on Pt-based catalysts dispersed in
polyaniline.

Kelaidopoulou, A.; Abelidou, E.; Papoutsis, A.; Polychroniadis, E. K.;

Kokkinidis, G. (Laboratory of Physical Chemistry, Department of
Chemistry, Aristotle University of Thessaloniki, Thessaloniki 54006,
Greece). J. Appl. Electrochem., 28(10), 1101-1106 (English) 1998

Chapman & Hall. CODEN: JAELEBJ. ISSN: 0021-891X. DOCUMENT

TYPE: Journal CA Section: 72 (Electrochemistry) Section

cross-reference(s): 36, 56, 67

Platinum dispersed in a polyaniline (PANI) film is a better catalyst than
smooth Pt for ethylene glycol electrooxidn. in perchloric acid aq. solns.
The catalytic activity of the platinum micro-particles is further enhanced
when Ru, Sn or both are codeposited. The PANI/Pt-Sn assembly
shows the highest electrocatalytic activity of the electrodes examd.
Underpotential deposition of Tl and Bi on dispersed Pt inhibits EG
electrooxidn. while Pb causes significant catalysis only with a specific
prepn. method electrocatalyst. The morphol. and the identity of the
metallic dispersion was examd. by TEM.

Keywords

electrooxidn ethylene glycol platinum catalyst dispersed polyaniline
tin platinum catalyst dispersed polyaniline ethylene glycol electrooxidn
ruthenium platinum catalyst dispersed polyaniline ethylene glycol
electrooxidn
thallium underpotential deposit platinum catalyst polyaniline ethylene
glycol electrooxidn

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Electrochemical oxidation catalysts

Pt-based catalysts dispersed in polyaniline for ethylene glycol

Microparticles

Pt-based microparticle catalysts dispersed in polyaniline for
ethylene glycol electrochem. oxidn.

Electrodeposits

Pt-based microparticle for catalysts dispersed in polyaniline for
ethylene glycol electrochem. oxidn.

Electrodeposits

underpotential; lead on platinum for catalysts dispersed in
polyaniline for ethylene glycol electrochem. oxidn.

25233-30-1

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Pt-based catalysts dispersed in polyaniline for electrooxidn. of ethylene glycol in perchloric acid aq. solns.

7440-69-9, uses

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7440-06-4, uses

12779-05-4

51402-57-4

84881-39-0

catalysts dispersed in polyaniline for electrooxidn. of ethylene glycol in perchloric acid aq. solns.

7439-92-1, uses

lead underpotential deposit on platinum as catalysts dispersed in polyaniline for electrooxidn. of ethylene glycol

7440-28-0, uses

thallium underpotential deposit effect on catalytic activity of platinum dispersed in polyaniline for electrooxidn. of ethylene glycol

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131:260031

Catalyzed wall fuel gas reformer assemblage for use in a fuel cell power plant.

Lesieur, Roger R. (International Fuel Cells LLC, USA). PCT Int. Appl.

WO 9953561 A1 21 Oct 1999, 13 pp. DESIGNATED STATES: W:

AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: H01M008-18. ICS:

F28D007-00; F28D021-00; B01J019-00; B01J007-00; C10J003-00.

APPLICATION: WO 1999-US8147 14 Apr 1999. PRIORITY: US

1998-61115 16 Apr 1998. DOCUMENT TYPE: Patent CA Section: 52

(Electrochemical, Radiational, and Thermal Energy Technology)

A fuel gas reformer assemblage for use in a fuel cell power plant is formed from a composite plate assembly which includes spaced-apart divider plates with interposed columns of individual fuel gas and burner gas passages. The fuel gas passages are provided with walls which are wash coated with a catalyzed alumina complex. The catalyst complex includes a nickel catalyst and a cerium and/or lanthanum oxide component which stabilizes the alumina against recrystn. in the catalyst complex. The catalyst complex also includes a calcium oxide component which inhibits carbon formation on the alumina surface. The cerium or lanthanum oxide and calcium oxide combine to provide a synergistic improvement in both alumina stabilization and also in inhibition of carbon deposits on the wash coated surfaces.

Keywords

fuel cell power plant reformer assemblage

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Reforming fuel gas manufacturing

Noble metals

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Fuel gases

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 1312-81-8
 11129-18-3
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 7440-02-0, uses
 7440-05-3, uses
 7440-06-4, uses
 catalyzed wall fuel gas reformer assemblage for use in fuel cell
 power plant
 1344-28-1, uses
 washcoat; catalyzed wall fuel gas reformer assemblage for use in
 fuel cell power plant

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131:230661
 A catalyst assembly technology in FCC - review of the concept,
 history and new developments.
 O'Connor, P.; Imhof, P.; Yanik, S. J. (Akzo Nobel Catalysts, Amersfoort
 3800AE, Neth.). Prepr. - Am. Chem. Soc., Div. Pet. Chem., 44(4),
 466-472 (English) 1999 American Chemical Society, Division of
 Petroleum Chemistry. CODEN: ACPCAT. ISSN: 0569-3799.
 DOCUMENT TYPE: Journal; General Review CA Section: 51 (Fossil
 Fuels, Derivatives, and Related Products)
 A review, with 28 refs., of FCC catalysts, with focus on non-zeolitic
 aspects of FCC catalyst technol.

Keywords

review petroleum cracking catalyst

Index Entries

Petroleum cracking catalysts
 FCC catalyst manuf. and properties

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131:132312
 Asymmetric electrodes for direct-feed fuel cells.
 Kindler, Andrew; Dawson, Stephen F. (California Institute of
 Technology, USA). PCT Int. Appl. WO 9940237 A1 12 Aug 1999, 26
 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG,
 BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH,
 GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,
 LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD,
 SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ,
 BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI,
 CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE,
 NL, PT, SE, SN, TD, TG. (English). (World Intellectual Property
 Organization). CODEN: PIXXD2. CLASS: ICM: C25B011-03. ICS:
 C25B011-00; C25B011-12; C25B013-00; H01M008-10;
 H01M004-86; B05D005-12. APPLICATION: WO 1999-US2677 8 Feb
 1999. PRIORITY: US 1998-21640 10 Feb 1998. DOCUMENT TYPE:
 Patent CA Section: 52 (Electrochemical, Radiational, and Thermal
 Energy Technology)
 An improved direct-feed fuel cell has a solid membrane electrolyte for
 electrochem. reactions of an org. fuel. Fuel crossover has been
 reduced due to pore structures blockage at the electrode-membrane
 interfaces of the membrane electrode assembly (MEA). Two
 improved MEA's are disclosed. One utilizes a multi-layer catalyst
 formation with a densest catalyst layer applied at the
 electrode-catalyst interfaces. Another utilizes an inert pore blocking

layer at the electrode-membrane interfaces.

Keywords

fuel cell membrane electrode assembly

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 7440-44-0, uses
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 67-63-0, uses
 softening and swelling agent; asym. electrodes for direct-feed fuel
 cells

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131:19772

Flexible interpenetrating networks formed by epoxy-cyanate ester
 compositions via a polyamide.
 Nguyen, Guy P.; Edwards, Carl (Johnson Matthey, Inc., USA). U.S. US
 5912316 A 15 Jun 1999, 12 pp. (English). (United States of America).
 CODEN: USXXAM. CLASS: ICM: C08G059-56. NCL: 528093000.
 APPLICATION: US 97-859792 19 May 1997. PRIORITY: US
 96-30242 8 Nov 1996. DOCUMENT TYPE: Patent CA Section: 37
 (Plastics Manufacture and Processing) Section cross-reference(s): 38,
 76

A resin compn., for use as a die attach adhesive, heat sink attach
 adhesive, encapsulant or underfill for semiconductor assemblies,
 comprises an epoxy resin and a cyanate ester resin, and a polyamide
 catalyst. The compn. is curable in 1 min at 200° and has a pot life '18
 h at room temp., is flexible, develops high adhesion, high moisture
 resistance, low wt. loss during curing and requires no solvents. Thus, a
 curable adhesive compn. contained L 10 24.3, 830 LVP 30.4, XB 4122
 30.4, HT 939 13.7, ArmaK 1363 0.6, Z 6040 0.6, and SiO₂ 57%.

Keywords

snap curable room temp stable plastic
 epoxy resin adhesive compn
 cyanate ester resin adhesive compn
 semiconductor assembly heat moisture resistance adhesive
 polyamide hardening agent adhesive compn

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 for cured product having high adhesion, high moisture
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excellent reliability

Adhesives

heat- and moisture-resistant; flexible interpenetrating networks
formed by epoxy-cyanate ester compns. via a polyamide
for

96141-20-7

830 LVP; formed by epoxy-cyanate ester compns. via a polyamide
catalyst for cured product having high adhesion, high
moisture resistance, good flexibility and high temp. stability
and excellent reliability

87435-38-9

135930-03-9

1156-51-0

47073-92-7

101657-77-6

128771-71-1

226701-37-7

226701-38-8

formed by epoxy-cyanate ester compns. via a polyamide catalyst
for cured product having high adhesion, high moisture
resistance, good flexibility and high temp. stability and
excellent reliability

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130:325773

Novel solid polymer electrolyte and multilayer electrochemical
assembly comprising such a solid polymer electrolyte.

Lascaud, Stephane; Baudry, Paul; Gramain, Philippe (Electricite De
France (Service National), Fr.). PCT Int. Appl. WO 9920677 A1 29 Apr
1999, 36 pp. DESIGNATED STATES: W: CA, JP, US; RW: AT, BE,
CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE.
(French). (World Intellectual Property Organization). CODEN: PIXXD2.
CLASS: ICM: C08G065-24. ICS: C08L071-03; H01M010-40.

APPLICATION: WO 98-FR2206 14 Oct 1998. PRIORITY: FR

97-12952 16 Oct 1997. DOCUMENT TYPE: Patent CA Section: 37

(Plastics Manufacture and Processing) Section cross-reference(s): 72

The solid polymer electrolyte comprises complexes of a matrix of linear
and cross-linked poly(ethylene oxide) (PEO) and radical-substituted
PEO segments, radical = chloromethyl, bromomethyl, iodomethyl
moieties and at least one ionizable alk. metal salt, has Tg of <40°,
crystallinity of less than 40%, and cond. of more than 5×10^{-6} S/cm
at/above 20°. The crosslinking agents are selected from thiols, esp.
trithiocyanuric acid, amines, esp. bis(aminopropyl ether),
diamine-terminated oligoethylene oxide or oligopropylene oxide. The
salts comprise metal cations, preferably Li⁺ and anions, e.g., BF₄⁻,
PF₆⁻, AsF₆⁻, ClO₄⁻, SCN⁻, I⁻, Br⁻, (C₆H₅)₄B⁻, BC₁₄⁻; the electrolytes also
contain one or more inorg. compds., e.g., MgO, Al₂O₃, CaO, Li₂CO₃,
CaCO₃, or glass fibers. The multilayer electrochem. assembly has a
pos. and neg. electrodes, current collectors, sepd. by the solid polymer
electrolyte layer; the anode is preferably Li. Thus, a polymer electrolyte
contg. 85.4% ethylene oxide segments and 14.6% epichlorohydrin
segments was prepd.; polymn. was carried out using
Et₃Al-acetylacetone catalyst in toluene under N atm. at about 107° and
the obtained polymer has Tg of - 49°, m.p. of 36°, and crystallinity of
13.5%. The copolymer was dissolved in acetonitrile, and MgO,
CaCO₃, or Li₂CO₃, trithiocyanuric acid, and lithium
bis(trifluoromethylsulfonyl)imide; the mixt. was placed on glass slides
and subjected to heat to induce crosslinking. The cond. of the films
was measured using a Li/electrolyte/Li cell assembly at 20-90°; the
cond. increased with temp. from 3.4×10^{-6} S/cm at 20° to 5.7×10^{-5} at
90°.

Keywords

polyethylene oxide lithium salt solid polymer electrolyte
thiocyanate crosslinking ethylene oxide epichlorohydrin copolymer
electrolyte
elec cond PEO lithium salt solid electrolyte cell

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24969-10-6, reaction products with trithiocyanuric acid, lithium complexes
65605-36-9, reaction products with epichlorohydrin-ethylene oxide copolymers, lithium complexes
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123-54-6, uses
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130:196400

Heterogenizing Homogeneous Catalysis Using Molecular
Self-Assembly of Long Alkane Chain Phosphines Bound to Rh(I)
Complexes.

Petrucchi, Maria G. L.; Kakkar, Ashok K. (Department of Chemistry,
McGill University, Montreal, PQ, Can.). Chem. Mater., 11(2), 269-276
(English) 1999 American Chemical Society. CODEN: CMATEX.

ISSN: 0897-4756. DOCUMENT TYPE: Journal CA Section: 22

(Physical Organic Chemistry) Section cross-reference(s): 67

Long alkane chain hydrocarbons terminated with OH and PPh₂ groups,
HO-(CH₂)_n-PPh₂ (n = 10-12) were self-assembled on inorg. oxide
surfaces via acid-base hydrolysis of surface-anchored [Si]-NET₂ groups
with terminal OH moieties and subsequently used to covalently anchor
Rh(I) complexes. Similar thin films can also be prepd. from [Si]-NET₂
and RhCl(1,5-C₈H₁₂)[PPh₂(CH₂)_nOH]. The functionalized surfaces
were characterized using solid-state NMR, contact angle goniometry,
ellipsometry, XPS, and FT-IR. The self-assembled organometallic thin
films were found to be highly active in catalyzing hydrogenation of tolan.
Surface-bound Rh(I) catalyst is stable and can be recycled, while the
homogeneous analog decomp. under similar catalytic reaction
conditions. The authors advise the use of safety in handling the piranha
soln. for surface prepn.

Keywords

self assembled film chain phosphine rhodium complex hydrogenation
catalyst
surface bound chain phosphine rhodium complex hydrogenation
catalyst
safety piranha soln

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of hydrogenation of tolan; surface characterization and evaluation of
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Hydrogenation

Hydrogenation catalysts

Monolayers

Surface structure

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7440-44-0, properties
7723-14-0, properties
7782-44-7, properties
7782-50-5, properties
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220742-35-8

220742-94-9

220742-98-3

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220742-94-9, silica-bound

220742-96-1

220742-98-3, silica-bound

220743-01-1

220743-04-4, silica-bound

3344-77-2

103-29-7

103-30-0

645-49-8

surface characterization and evaluation of catalytic activity in tolan
hydrogenation of self-assembled monolayer films of
rhodium-cyclooctadiene-chain phosphine complexes on
silica

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130:125576

Precise synthesis of monosubstituted polyacetylenes using Rh complex
catalysts. Control of solid structure and p-conjugation length.

Tabata, Masayoshi; Sone, Takeyuchi; Sadahiro, Yoshikazu (Dep.

Molecular Chem., Graduate School Eng., Hokkaido Univ., Sapporo

060, Japan). Macromol. Chem. Phys., 200(2), 265-282 (English) 1999

Wiley-VCH Verlag GmbH. CODEN: MCHPES. ISSN: 1022-1352.

DOCUMENT TYPE: Journal; General Review CA Section: 36 (Physical
Properties of Synthetic High Polymers)

A review with 53 refs. summarizing and discussing the authors' results.

Stereospecific polymn. of monosubstituted acetylenes was successfully

performed using a Rh complex, [Rh(norbornadiene)Cl]₂, as a catalyst,

and the resulting polyacetylenes were characterized in detail by ¹H

NMR, ESR, laser Raman, diffuse reflective UV, and wide-angle x-ray

diffraction. The Rh complex was found to yield selectively the

cis-transoid isomer even at room temp. in high yields when alc. or

triethylamine was used as the solvent. Addnl., the resulting

cis-polyacetylenes were found to form a pseudohexagonal, columnar

self-assembly or superstructure. Further compression of the

cis-polymers induced cis-trans isomerization even at room temp. under

vacuum, breaking rotationally the cis-C:C bonds and, thus, giving

p-radicals as the origin of magnetic properties.

Keywords

review polyacetylene rhodium catalyst structure isomerization

crystal structure polyacetylene rhodium catalyst review

configuration polyacetylene rhodium catalyst review

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Cis-trans isomerization

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prepd. in presence of Rh complex catalysts

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cis-; chain and crystal structure of monosubstituted polyacetylenes

prepd. in presence of Rh complex catalysts

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74-86-2, derivs., polymers
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prepd. in presence of Rh complex catalysts

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130:113961

Method for manufacturing multichannel structures and processes for
making structures using carbon filler.

Tuchinskiy, Lev J.; Mallia, Robert A. (Materials and Electrochemical
Research (MER) Corporation, USA). U.S. US 5864743 A 26 Jan
1999, 9 pp. (English). (United States of America). CODEN: USXXAM.

CLASS: ICM: B22F007-02. NCL: 419002000. APPLICATION: US
96-744359 6 Nov 1996. DOCUMENT TYPE: Patent CA Section: 57
(Ceramics)

A composite rod comprising an outer shell and an inner core is formed
of resp. mixts. of powders. The mixt. for the outer shell comprises a
sinterable powd. structural material such as ceramic material, metal,
intermetallic compds., and a powd. binder. The inner core comprises a
powd. C channel-forming filler material, e.g., graphite or amorphous C,
and a powd. binder. The composite rod may be deformed, as by
extrusion, to reduce its diam. A bundle of composite rods is
assembled and deformed, as by extrusion, to reduce the diam. of the
bundle and of its component composite rods. Further bundles of the
reduced diam. bundles of composite rods may be likewise deformed
by extrusion to further reduce the diam. of the component composite
rods of the successive bundles and to increase the no. of rods per
given cross-sectional area of the bundle. The final assembly of
bundles is consolidated and the binder is removed, as by heating,
followed by removal of the C inner cores of the composite rods of the
assembly of bundles by oxidn. and sintering of the remaining structure
of ceramic or metal, as the case may be. The multichannel structures
are suitable for use as filters, catalyst supports, and the like. A
multichannel Al₂O₃ structure was manufd. from 50 wt. parts Al₂O₃
powder (av. particle size 1.3 mm) and 50 wt. parts binder consisting of
a mixt. of 90% paraffin and 10% beeswax, and a filler mixt. consisting
of 50 wt. parts graphite powder (av. particle size 20 mm) and 50 wt.
parts binder as above. The binder was removed at 400° and the
composite structure sintered at 1600° for 2 h.

Keywords

wax binder graphite ceramic powder
multichannel structure ceramic
beeswax paraffin wax binder
polyethylene wax binder
alumina multichannel ceramic structure
silicon carbide multichannel ceramic structure
filter multichannel ceramic structure
catalyst support multichannel ceramic structure

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binder wax and sacrificial channel material and

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9002-88-4

wax, binders contg.; multichannel structure manuf. from compns.

contg. sacrificial channel material and

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131:328068

Assembly of LDH and cobalt(II) sulfophthalocyanine and catalytic
activity in oxidation of sulfide.

Hu, Ximing; Mei, Zhiqian; Liu, Haiyang; Gu, Yunli; Huang, Zhongtao;
Wang, Lefu (College of Chemical Engineering, South China University
of Technology, Peop. Rep. China). Huanan Ligong Daxue Xuebao,
Ziran Kexueban, 27(9), 1-5 (Chinese) 1999 Huanan Ligong Daxue
Xuebao Bianji Wei yuanhui. CODEN: HLDKEZ. ISSN: 1000-565X.

DOCUMENT TYPE: Journal CA Section: 67 (Catalysis, Reaction
Kinetics, and Inorganic Reaction Mechanisms)

Layered double hydroxides (LDH) is prepd. and sulfophthalocyanine
Cobalt (CoPcTs) is assembled in the LDH host by electrostatic and
Vandvallee's attraction. The catalytic activity of the LDHCoPcTs and
CoPcTs for the oxidn. of S²⁻ with oxygen is investigated. The results
indicate that there are the different rate-limiting steps for oxidn. of S²⁻
catalyzed by LDHCoPcTs and CoPcTs.

Keywords

layered double hydroxide cobalt sulfophthalocyanine catalyst oxidn
sulfide

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Oxidation catalysts

Hydroxides (inorganic)

assembly of LDH and cobalt(II) sulfophthalocyanine and catalytic
activity in oxidn. of sulfide

28802-06-4

18496-25-8

assembly of LDH and cobalt(II) sulfophthalocyanine and catalytic
activity in oxidn. of sulfide

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131:310909

Synthesis of a Conjugated Donor/Acceptor/Passivator (DAP) Polymer.
Devasagayaraj, A.; Tour, James M. (Department of Chemistry and Biochemistry, University of South Carolina, Columbia, SC 29208, USA). *Macromolecules*, 32(20), 6425-6430 (English) 1999 American Chemical Society. CODEN: MAMOBX. ISSN: 0024-9297.
DOCUMENT TYPE: Journal CA Section: 35 (Chemistry of Synthetic High Polymers) Section cross-reference(s): 28, 36
A conjugated polythiophene that possesses main-chain donor/acceptor repeat units sepd. by aryl passivating units was designed and prepd. using retro-synthetic anal. methods. This donor/acceptor/passivator (DAP) polymer comprises sequential electron-rich N,N'-dimethyl-3,4-diaminothiophene, electron-deficient 3,4-dinitrothiophene, and passivating phenylene repeat units and was prepd. via Stille coupling reactions. Several transformations were carried out on thiophene cores to construct the monomer units: tert-butoxycarbonyl (Boc) amine protection, selective mono-stannylation, selective mono-debromination, lithium tetramethylpiperidide (LTMP) induced lithiation on nitrothiophenes, and selective stannylation using Bu₃SnSnBu₃/Pd on phenylene iodide over thienyl bromide. The Stille polymn. afforded the Boc-protected DAP polymer; ZnCl₂-catalyzed Boc removal afforded the desired DAP polymer; however, its insoly. curtailed detailed studies of the properties.

Keywords

thiophene donor acceptor passivator polymer prepn Stille coupling
polythiophene substituent donor acceptor passivator prepn
stannylation debromination lithiation thiophene polymer prepn

Index Entries

Polymerization

Stille coupling; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions

Coupling reaction catalysts

Stille; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions

Polymer chain sequence distribution

donor-acceptor-passivator arrangement; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions

Conjugated polymers

Polymers, preparation

polythiophenes; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions

Debromination

Lithiation

Stille coupling reaction

prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions

NMR (nuclear magnetic resonance)

spectra; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions

Metalation

stannylation; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions

13965-03-2

Stille coupling and Stille polymn. catalyst; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions
51364-51-3

Stille coupling catalyst; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions
603-32-7

Stille coupling reagent; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions
247934-85-6

donor-acceptor-passivator monomer; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions
247934-67-4

247934-87-8, deprotected

donor-acceptor-passivator polythiophene; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions
247934-79-8

intermediate, donor-acceptor-passivator assembly; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions
52010-62-5

69723-91-7

247934-73-2

247934-75-4

247934-77-6

247934-83-4

intermediate; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions
106-40-1

109-63-7

109-72-8, reactions

128-08-5

540-80-7

558-13-4

768-66-1

813-19-4

1461-22-9

7553-56-2, reactions

14332-09-3

52431-30-8

207802-16-2

247934-71-0

247934-81-2

247934-87-8

247934-67-4, deprotected

247934-69-6

prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions
7646-85-7, uses

t-butoxycarbonyl deprotection catalyst; prepn. of monomer and polymn. to obtain conjugated donor/acceptor/passivator (DAP) polythiophene via Stille coupling reactions

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131:272812

Continuous method for manufacture of IC cards and the IC cards.
Ota, Hideo; Okuyama, Akio (Toshiba Corp., Japan). Jpn. Kokai

Tokkyo Koho JP 11272831 A2 8 Oct 1999 Heisei, 13 pp. (Japanese).
(Japan). CODEN: JKXXAF. CLASS: ICM: G06K019-077. ICS:
B29C069-00; G06K019-07; B29C035-00; B29K101-10; B29L009-00.

APPLICATION: JP 1998-70807 19 Mar 1998. DOCUMENT TYPE:
Patent CA Section: 38 (Plastics Fabrication and Uses) Section
cross-reference(s): 76

The manuf. comprises steps of: (A) clamping a core sheet bearing an
IC module embedded in an opening between 2 cover sheets which
have been coated with a resin contg. microcapsule-type latent curing
catalyst, (B) hot-pressing the assembly at 120-180° to fuse and load
the resin into the opening on the core sheet while crushing the catalyst,
(C) curing the resin in an oven, and (D) cooling.

Keywords

IC card continuous manuf process
polymer laminate IC card continuous manuf
latent curing catalyst IC card continuous manuf
plastic laminate IC card continuous manuf process
packaging IC card continuous process

Index Entries

Epoxy resins, uses
adhesives; in continuous method for manuf. of IC cards and IC
cards
Electronic packaging materials
Encapsulation
Integrated circuits
Printed circuit boards
Laminated plastics, uses
continuous method for manuf. of IC cards and IC cards
Adhesives
in continuous method for manuf. of IC cards and IC cards
Crosslinking catalysts
latent; continuous method for manuf. of IC cards and IC cards
40216-08-8
159730-58-2
135600-61-2
adhesives; continuous method for manuf. of IC cards and IC cards
149779-74-8
continuous method for manuf. of IC cards and IC cards

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131:234736

Modified electrode surfaces for catalytic reduction of carbon dioxide.
Jarzebinska, A.; Rowinski, P. b.; Zawisza, I.; Bilewicz, R.; Siegfried, L.;
Kaden, T. (Department of Chemistry, University of Warsaw, Warsaw
02-093, Pol.). Anal. Chim. Acta, 396(1), 1-12 (English) 1999 Elsevier
Science B.V. CODEN: ACACAM. ISSN: 0003-2670. DOCUMENT
TYPE: Journal CA Section: 72 (Electrochemistry) Section
cross-reference(s): 67
Ni(II) complexes with substituted tetraazacyclotetradecanes were
incorporated into Nafion films or assembled in monolayers on
electrodes in order to obtain electrocatalytic systems for the redn. of
carbon dioxide. Reproducible and stable loading of the Nafion films
with the complexes has been obsd. Systematic increase of N-Me
substitution of the catalytic [Ni(cyclam)]²⁺ complex leads to a shift of the
Ni(II)L/Ni(I)L formal potential to more pos. values, however, at the same
time to a decrease of the catalytic current of CO₂ redn. Monolayer
techniques - the Langmuir-Blodgett and self-assembly methods - were
found advantageous for the prepn. of electrode surfaces active in the
catalytic redn. of CO₂ compared to Nafion coatings contg. the catalyst.
Glassy carbon electrode was suitable for the transfer of

Langmuir-Blodgett monolayers. Catalysis was obsd. only when the electrode was touching the monolayer at the air-water interface or was covered in the dipping mode, hence when the catalyst mols. were oriented with their alkyl chains towards the substrate and macrocyclic head-group towards the soln. Most efficient catalysis was found using electrodes coated by the self-assembly procedure with monolayers of the cyclam complex modified with a pyridine side group. The role of the pyridine moieties was to anchor the catalytic monolayer to the electrode surface.

Keywords

modified electrode surface catalytic redn carbon dioxide
nickel II substituted tetraazacyclotetradecane complex incorporated
Nafion film

Index Entries

Electrochemical reduction catalysts

Ni(II) complexes with substituted tetraazacyclotetradecanes
incorporated into Nafion films or assembled in monolayers
on electrodes for obtaining electrocatalytic systems for
redn. of carbon dioxide

Electrochemical reduction

catalytic; modified electrode surfaces for catalytic redn. of carbon
dioxide

Glassy carbon electrodes

cyclam complexes immobilized in Nafion films on glassy carbon
electrodes

Polyoxyalkylenes, uses

fluorine- and sulfo-contg., ionomers; cyclam complexes
immobilized in Nafion films on glassy carbon electrodes

Chemically modified electrodes

modified electrode surfaces for catalytic redn. of carbon dioxide

Fluoropolymers, uses

polyoxyalkylene-, sulfo-contg., ionomers; cyclam complexes
immobilized in Nafion films on glassy carbon electrodes

Ionomers

polyoxyalkylenes, fluorine- and sulfo-contg.; cyclam complexes
immobilized in Nafion films on glassy carbon electrodes

7440-02-0, complexes with substituted tetraazacyclotetradecanes

48175-68-4

52610-79-4

57379-00-7

57379-02-9, complexes with nickel

57379-06-3

93984-20-4

103364-89-2

126182-88-5

185306-90-5

207797-06-6

207797-07-7

207996-22-3

244015-12-1

244015-14-3

71366-36-4

244014-38-8

244014-40-2

Ni(II) complexes with substituted tetraazacyclotetradecanes
incorporated into Nafion films or assembled in monolayers
on electrodes for obtaining electrocatalytic systems for
redn. of carbon dioxide

7601-89-0

cyclic voltammograms for Ni(II) complexes with substituted
tetraazacyclotetradecanes in Nafion coating on glassy

carbon electrodes in soln. contg.
124-38-9, reactions
modified electrode surfaces for catalytic redn. of carbon dioxide

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131:173413

Polyurethane-forming resin no-bake binders for foundry sand molds and cores.

Chen, Chia-Hung; Chang, Ken K.; Haugse, A. Leonard; Dando, Thomas E. (Ashland Inc., USA). PCT Int. Appl. WO 9943455 A1 2 Sep 1999, 20 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG. (English). (World Intellectual Property Organization). CODEN: PIXXD2.

CLASS: ICM: B22C001-22. ICS: B22C003-00. APPLICATION: WO 1999-US3916 23 Feb 1999. PRIORITY: US 1998-32690 28 Feb 1998. DOCUMENT TYPE: Patent CA Section: 56 (Nonferrous Metals and Alloys)

The no-bake binder system for foundry sand comprises: (a) phenolic resin with a solvent and minor HF and an organosilane; (b) org. polyisocyanate resin; and (c) controlled amt. of liq. tertiary amine as catalyst for hardening near room temp. The binder system has the phenolic resin and polyisocyanate components at the hydroxyl:isocyanate group ratio of preferably 1.25:1 to 1:1.25, and the phenolic resin component contains 0.05-0.15% HF, 0.1-0.5% organosilane, and 1.25-5.0% liq. tertiary amine catalyst by wt. The catalyst is typically 4-Ph Pr pyridine in arom. solvent. The sand mixt. with 10% binder is placed in a pattern box and held for hardening, followed by mech. removal of the manufd. mold or core. The foundry molds and cores are typically assembled for casting of molten Al alloys, followed by the melt solidification and mech. removal of the cast article from the spent mold assembly. The SiO₂ sand cores contg. 1.25% binder with all additives showed the 30-min tensile strength of 126 psi, and the 24-h strength of 360 psi at 50% humidity and 316 psi at 90% humidity, vs. the 24-h 90% humidity strength of only 97 psi in the absence of HF and organosilane, or 167 psi in the absence of organosilane.

Keywords

foundry sand resin binder hardening amine
hydrofluoric acid addn resin binder foundry sand
polyurethane binder foundry sand mold core

Index Entries

Tertiary amines

Phenolic resins, uses

Silanes

binders with; resin no-bake binders with hydrofluoric acid for foundry sand molds and cores

Polyurethanes, uses

binders; resin no-bake binders with hydrofluoric acid for foundry sand molds and cores

Molds (forms)

sand cores and; resin no-bake binders with hydrofluoric acid for foundry sand molds and cores

2057-49-0

23779-32-0

binder with; polyurethane-forming resin no-bake binders for foundry

sand molds and cores
7664-39-3, uses
foundry binder with; polyurethane-forming resin no-bake binders for
foundry sand molds and cores
75-13-8, esters, polymers
polyisocyanates, binders with; polyurethane-forming resin no-bake
binders for foundry sand molds and cores

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131:159684

Transmission electron microscopic examination of proton exchange
membrane fuel cell components.

Xu, Hongfeng; Han, Ming; Yi, Baolian (Dept. of Applied Chemistry,
Dalian Railway Institute, Dalian 116028, Peop. Rep. China). Dianyuan
Jishu, 23(3), 184-185 (Chinese) 1999 Dianyuan Jishu Bianjibu.

CODEN: DIJIFT. ISSN: 1002-087X. DOCUMENT TYPE: Journal CA
Section: 52 (Electrochemical, Radiational, and Thermal Energy
Technology) Section cross-reference(s): 38

Proton exchange membrane fuel cells use a perfluorosulfonic solid
polymer film as electrolyte that simplifies management of water and
electrolyte. The thin layers of electrolyte give high specific energy. The
high reliability and friendly environment make them particularly
attractive as power sources in space, land and marine applications.
The fuel cell components have significant effects on the performances
of fuel cell. In this paper, TEM was used to phys. characterize proton
exchange membrane fuel cell components, which included platinum
catalysts, electrode surfaces, catalyst layer thickness and membrane
electrode assembly. The results show that the dispersion is important
in prepg. catalyst and that the thickness of catalyst layer reduces to
half after hot suppress; also too much Nafion in electrode will increase
the membrane resistance.

Keywords

proton exchange membrane fuel cell TEM

Index Entries

Polyoxyalkylenes, uses
fluorine- and sulfo-contg., ionomers; transmission electron
microscopic examn. of proton exchange membrane fuel cell
components
Fluoropolymers, uses
polyoxyalkylene-, sulfo-contg., ionomers; transmission electron
microscopic examn. of proton exchange membrane fuel cell
components
Ionomers
polyoxyalkylenes, fluorine- and sulfo-contg.; transmission electron
microscopic examn. of proton exchange membrane fuel cell
components
Electrocatalysts
Fuel cells
Transmission electron microscopy
transmission electron microscopic examn. of proton exchange
membrane fuel cell components
7440-06-4, uses
transmission electron microscopic examn. of proton exchange
membrane fuel cell components

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130:331831

Binuclear versus mononuclear copper complexes as catalysts for
asymmetric cyclopropanation of styrene.

Cai, Lisheng; Mahmoud, Hussein; Han, Ying (Department of Chemistry, the University of Illinois at Chicago, Chicago, IL 60607, USA).
Tetrahedron: Asymmetry, 10(3), 411-427 (English) 1999 Elsevier Science Ltd. CODEN: TASYE3. ISSN: 0957-4166. DOCUMENT
TYPE: Journal CA Section: 78 (Inorganic Chemicals and Reactions)
Section cross-reference(s): 24, 67, 75

A no. of (S)-(-)-2-amino-1,1-diaryl-1-propanol compds. were synthesized. They were used to form the binuclear Cu complexes through a spontaneous assembly of the individual components, the b-aminoalc., 2-hydroxy-5-methyl-1,3-benzenedialdehyde, and Cu acetate monohydrate, in MeOH. These binuclear complexes were examd. as asym. catalysts for cyclopropanation of styrene by Et diazoacetate. Moderate improvement in enantioselectivity was obsd. for the binuclear vs. mononuclear Cu complexes which were prepd. via condensation of the b-aminoalc. with salicylaldehyde. The e.e. values up to 87% for trans and 93% for cis products and the ratio between trans and cis products up to 9:1 were obtained. The mol. structure of binuclear copper complex I.4MeOH was detd. by x-ray crystallog.

Keywords

copper Schiff base mononuclear binuclear prepn
crystal structure copper Schiff base binuclear
amino alc chiral prepn Schiff condensation copper template
cyclopropanation catalyst copper Schiff base mononuclear binuclear

Index Entries

Cyclopropanation catalysts
asym. cyclopropanation of styrene catalyzed by binuclear and mononuclear copper Schiff base complexes derived from chiral aminodiphenylpropanol
Transition metal Schiff base complexes
copper; prepn. of binuclear and mononuclear copper Schiff base complexes as asym. cyclopropanation catalysts of styrene
Crystal structure
of copper Schiff base binuclear complex derived from chiral aminodiphenylpropanol and hydroxy(methyl)benzenedialdehyde
Molecular structure
of copper Schiff base binuclear complex derived from chiral aminodiphenylpropanol hydroxy(methyl)benzenedialdehyde
Amino alcohols
prepn. of chiral aminodiphenylpropanols and Schiff condensation with arylaldehydes on copper template
Bromination
regioselective; of 4-tert-butylphenol and of tert-Bu 4-tert-butylphenyl ether at ortho position to O-group
Cyclopropanation
stereoselective; asym. cyclopropanation of styrene catalyzed by binuclear and mononuclear copper Schiff base complexes derived from chiral aminodiphenylpropanol
100-42-5, reactions
623-73-4
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75-26-3
76-83-5
100-39-0
111-83-1
776-74-9
for etherification of 2-bromo-4-tert-butylphenol
507-20-0

for etherification of 4-tert-butylphenol
 52458-11-4
 57685-36-6
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 56661-65-5
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 56698-51-2
 78603-91-5
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 hydroxy(methyl)benzenedialdehyde and copper template
 223768-58-9
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 223768-70-5
 223768-75-0
 223768-83-0
 223768-86-3
 223768-88-5
 223768-90-9
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 prepn. and catalyst for asym. cyclopropanation of styrene with Et
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 prepn. and crystal structure of
 2198-66-5
 prepn. and etherification with alkyl bromides
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 prepn. and regioselective bromination of
 34703-00-9
 34716-60-4
 prepn. by asym. cyclopropanation of styrene with Et diazoacetate
 catalyzed by binuclear and mononuclear copper Schiff
 base complexes derived from chiral aminodiarylpropanol
 223768-79-4
 prepn., mol. structure, and catalyst for asym. cyclopropanation of
 styrene with Et diazoacetate
 98-54-4
 regioselective bromination or etherification with tert-Bu chloride

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130:288361

Oxygen reduction catalysts for polymer electrolyte fuel cells from the
 pyrolysis of FeII acetate adsorbed on

3,4,9,10-perylenetetracarboxylic dianhydride.

Faubert, G.; Cote, R.; Dodelet, J. P.; Lefevre, M.; Bertrand, P.

(INRS-Energie et Materiaux, Varennes, PQ J3X 1S2, Can.).

Electrochim. Acta, 44(15), 2589-2603 (English) 1999 Elsevier Science

Ltd. CODEN: ELCAAV. ISSN: 0013-4686. DOCUMENT TYPE:

Journal CA Section: 72 (Electrochemistry) Section cross-reference(s):

36, 66, 67, 73

Catalysts for O₂ redn. in acidic media were prepd. from the pyrolysis of
 Fe acetate adsorbed on perylenetetracarboxylic dianhydride (PTCDA)
 in Ar:H₂:NH₃ ambient. The amt. of adsorbed Fe acetate ranged from 0
 to 25600 ppm Fe nominal. Catalysts are obtained when the pyrolysis
 temp. is at least 800°C, but 900°C gives the best results. RDE anal.
 demonstrates that the catalytic activity increases first with the Fe
 content but levels off for Fe contents larger than 5000 ppm (0.5 wt%
 Fe). GDE measurements in a single membrane electrode assembly
 indicate that the polarization curve obtained with a catalyst contg. 0.2
 wt% Fe is similar to the one obtained for 2 wt% Pt. The prepd.

catalysts have been characterized by neutron activation anal., XRD, TEM, ToF SIMS and XPS. From these characterizations, one may conclude that an oxidized state of Fe and pyridinic type nitrogen are both involved in the compn. of the catalytic site for O₂ redn. obtained at high pyrolysis temp. Pyridinic type nitrogens account for about 1/3 of the N1s signal detected by XPS at the surface of the catalyst. Beyond 0.5 wt% Fe, a plateau is reached in the catalytic activity because Fe in excess begins to form aggregates contg. metallic and/or carbidic iron that are detectable by TEM and XRD. These aggregates have no catalytic activity for O₂ redn.

Keywords

oxygen redn electrocatalysis polymer electrolyte iron acetate pyrolysis

Index Entries

X-ray diffraction

by pyrolyzed 3,4,9,10-perylenetetracarboxylic dianhydride contg Fe

Electrochemical reduction

catalytic; oxygen redn. catalysts for polymer electrolyte fuel cells from pyrolysis of FeII acetate adsorbed on

3,4,9,10-perylenetetracarboxylic dianhydride

Electrolytic polarization

in H₂/O₂ fuel cell with pyrolyzed 3,4,9,10-perylenetetracarboxylic dianhydride contg Fe or Pt/C as cathode catalyst

Binding energy

in pyrolyzed 3,4,9,10-perylenetetracarboxylic dianhydride contg Fe

Electrocatalysts

non-noble metal based; oxygen redn. catalysts for polymer electrolyte fuel cells from pyrolysis of FeII acetate adsorbed on 3,4,9,10-perylenetetracarboxylic dianhydride

Thermal decomposition

of 3,4,9,10-perylenetetracarboxylic dianhydride powders contg. iron acetate in Ar-NH₃-H₂ atm.

Surface analysis

of catalysts for polymer electrolyte fuel cells from pyrolysis of FeII acetate adsorbed on 3,4,9,10-perylenetetracarboxylic dianhydride

Cyclic voltammetry

of oxygen redn. catalysts from pyrolysis of FeII acetate adsorbed on 3,4,9,10-perylenetetracarboxylic dianhydride on rotating disk electrode

Surface structure

TOF-SIMS (time-of-flight secondary-ion mass spectrometry)

X-ray photoelectron spectroscopy

of pyrolyzed 3,4,9,10-perylenetetracarboxylic dianhydride contg Fe

Fuel cells

Polymer electrolytes

oxygen redn. catalysts for polymer electrolyte fuel cells from pyrolysis of FeII acetate adsorbed on

3,4,9,10-perylenetetracarboxylic dianhydride

128-69-8

oxygen redn. catalysts for polymer electrolyte fuel cells from pyrolysis of FeII acetate adsorbed on

3094-87-9

oxygen redn. catalysts for polymer electrolyte fuel cells from pyrolysis of FeII acetate adsorbed on

3,4,9,10-perylenetetracarboxylic dianhydride

7440-37-1, uses

1333-74-0, properties

7664-41-7, properties

pyrolysis of 3,4,9,10-perylenetetracarboxylic dianhydride powders contg. iron acetate in Ar-NH₃-H₂ atm.

7782-44-7, properties

redn. catalysts for polymer electrolyte fuel cells from pyrolysis of FeII acetate adsorbed on 3,4,9,10-perylenetetracarboxylic dianhydride

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130:157635

Method and assembly for removing nitrogen oxides present in exhaust gas, using heat exchanger.

Bouchez, Matthias; Martin, Brigitte (Institut Francais du Petrole, Fr.).

Fr. Demande FR 2764638 A1 18 Dec 1998, 11 pp. (French).

(France). CODEN: FRXXBL. CLASS: ICM: F01N003-20. ICS:

F01N007-08; F01N003-36; B01D053-94; B01D053-56; B01D053-30.

APPLICATION: FR 97-7555 16 Jun 1997. DOCUMENT TYPE: Patent

CA Section: 59 (Air Pollution and Industrial Hygiene) Section

cross-reference(s): 51

Nitrogen oxides are removed from exhaust gases using a redn. catalyst and a reducing agent, e.g., hydrocarbons, with the addn. of a heat exchanger for cooling the gases to an optimum temp.

Keywords

heat exchanger nitrogen oxide redn

Index Entries

Diesel exhaust gases

Exhaust gases (engine)

Heat exchangers

Hydrocarbons, uses

method and assembly for removing nitrogen oxides present in

exhaust gas, using heat exchanger

11104-93-1, processes

method and assembly for removing nitrogen oxides present in

exhaust gas, using heat exchanger

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131:312004

Engineering of nanosize superparamagnetic particles for use in magnetic carrier technology.

Xu, Zhenghe; Liu, Qingxia; Finch, James A. (Department of Chemical and Materials Engineering, University of Alberta, Edmonton, AB, Can.).

Surfactant Sci. Ser., 78(Surfaces of Nanoparticles and Porous

Materials), 31-50 (English) 1999 Marcel Dekker, Inc. CODEN:

SFSSA5. ISSN: 0081-9603. DOCUMENT TYPE: Journal; General

Review CA Section: 48 (Unit Operations and Processes) Section

cross-reference(s): 9, 60, 63, 67, 77

A review with 50 refs. The major challenge to the application of magnetic carrier technol. in various areas lies in the engineering of a robust tailored surface functionality. Surface engineering technologies, i.e. mol. self assembly and silica coating followed by silanization, are described for prodn. of superparamagnetic particles as magnetic carriers.

Keywords

review superparamagnetic nanoparticle magnetic carrier

Index Entries

Catalyst supports

Drug delivery systems

Self-assembly

Self-association

Separators
 Silylation
 Wastewater treatment
 engineering of superparamagnetic nanoparticles for magnetic
 carriers
 Magnetic particles
 Nanoparticles
 Paramagnetic materials
 superparamagnetic; engineering of superparamagnetic
 nanoparticles for magnetic carriers
 7631-86-9, uses
 coatings; engineering of superparamagnetic nanoparticles for
 magnetic carriers

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131:303800

EXAFS observation of Li additive effect on structure of Rh particles
 supported on zeolite.

Bando, Kyoko K.; Ichikuni, Nobuyuki; Arakawa, Hironori; Asakura,
 Kiyotaka (Japan Science and Technology Corporation, Saitama
 332-0012, Japan). Jpn. J. Appl. Phys., Part 1, 38(Suppl. 1,
 Synchrotron Radiation in Materials Science), 81-84 (English) 1999
 Japanese Journal of Applied Physics. CODEN: JAPNDE. ISSN:
 0021-4922. DOCUMENT TYPE: Journal CA Section: 67 (Catalysis,
 Reaction Kinetics, and Inorganic Reaction Mechanisms) Section
 cross-reference(s): 66, 73

The Rh ion-exchanged zeolite catalyst (RhY) shows extraordinarily
 high activity for CO₂ conversion and the main product was methane.
 When we doped Li into RhY (Li/RhY), the main product drastically
 changed from methane to CO and promotion of ethanol formation was
 obsd. In this work, we obsd. EXAFS spectra for RhY and Li/RhY and
 elucidated the structural difference between them, in order to reveal the
 origin of the different catalyzes toward CO₂ hydrogenation. We found
 disassembly and re-assembly of Rh particles in RhY during the
 reaction where Rh atoms could easily move around the pore and
 external surface of zeolite. On the other hand, the Rh atoms in Li/RhY
 were tightly bound in the Rh particles under the influence of Li additive
 and the Rh atoms kept their structure unchanged during the reaction.
 This suggests that the difference in catalytic reactivity was due to that in
 the mobility of Rh particles.

Keywords

EXAFS lithium additive structure rhodium particle supported zeolite
 carbon dioxide hydrogenation lithium rhodium zeolite catalyst

Index Entries

Coordination number
 Particle size
 Y zeolites
 EXAFS observation of Li additive effect on structure of Rh particles
 supported on zeolite Y
 Hydrogenation
 Hydrogenation catalysts
 EXAFS observation of Li additive effect on structure of Rh particles
 supported on zeolite Y after use in hydrogenation of CO₂
 7440-16-6, uses
 7439-93-2, uses
 EXAFS observation of Li additive effect on structure of Rh particles
 supported on zeolite Y
 124-38-9, reactions
 EXAFS observation of Li additive effect on structure of Rh particles
 supported on zeolite Y after use in hydrogenation of

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131:303797

Textural Mesoporosity and the Catalytic Activity of Mesoporous Molecular Sieves with Wormhole Framework Structures.

Pauly, Thomas R.; Liu, Yu; Pinnavaia, Thomas J.; Billinge, Simon J. L.; Rieker, Thomas P. (Department of Chemistry and Center for Fundamental Materials Research Department of Physics and Astronomy, Michigan State University, East Lansing, MI 48824, USA). J. Am. Chem. Soc., 121(38), 8835-8842 (English) 1999 American Chemical Society. CODEN: JACSAT. ISSN: 0002-7863.

DOCUMENT TYPE: Journal CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms) Section

cross-reference(s): 25, 66

Three different water-alc. cosolvent systems were used to assemble mesoporous mol. sieve silicas with wormhole framework structures (previously denoted HMS silicas) from an elec. neutral amine surfactant (S°) and a silicon alkoxide precursor (I°). The fundamental particle size and assocd. textural (interparticle) porosity of the disordered structures were correlated with the soly. of the surfactant in the water-alc. cosolvents used for the $S^{\circ}I^{\circ}$ assembly process. Polar cosolvents contg. relatively low vol. fractions of $C_nH_{2n+1}OH$ alcs. ($n = 1-3$) gave heterogeneous surfactant emulsions that assembled intergrown aggregates of small primary particles with high textural pore vols. (designated HMS-HTx). Conversely, three-dimensional, monolithic particles with little or no textural porosity (designated HMS-LTx) were formed from homogeneous surfactant solns. in lower polarity cosolvents. Aluminum substituted Al-HMS-HTx analogs with high textural porosity and improved framework accessibility also were shown to be much more efficient catalysts than Al-HMS-LTx or monolithic forms of hexagonal Al-MCM-41 for the sterically demanding condensed phase alkylation of 2,4-di-tert-butylphenol with cinnamyl alc. Transmission electron microscopy (TEM) and small-angle X-ray scattering (SAXS) studies verified the textural differences between wormhole HMS and electrostatically assembled hexagonal MCM-41 and SBA-3 mol. sieves. Power law fits to the scattering data indicated a surface fractal ($D_s = 2.76$) for HMS-HTx, consistent with rough surfaces. A second power law at lower- q indicated the formation of a mass fractal ($D_m = 1.83$) consistent with branching of small fundamental particles. Hexagonal MCM-41 and SBA-3 silicas, on the other hand, exhibited scattering properties consistent with moderately rough surfaces ($D_s = 2.35$ and 2.22 , resp.) and large particle diams. ($\gg 1$ nm). HMS-LTx silicas showed little or no mass fractal character ($D_m = 2.87$), and no surface fractal scattering.

Keywords

textural mesoporosity mol sieve wormhole framework structure
alkylation catalyst mesoporosity mol sieve wormhole framework structure
butylphenol cinnamyl alc alkylation catalyst mol sieve wormhole framework

Index Entries

Zeolite MCM-41

Al-MCM-41; textural mesoporosity and catalytic activity of mesoporous mol. sieves with wormhole framework structures

Alkylation catalysts

for 2,4-di-tert-butylphenol with cinnamyl alc.; textural mesoporosity and catalytic activity of mesoporous mol. sieves with wormhole framework structures

Crystal structure-property relationship

Molecular sieves
 Particle size
 Porosity
 Surfactants
 Alcohols, properties
 textural mesoporosity and catalytic activity of mesoporous mol.
 sieves with wormhole framework structures
 96-76-4
 alkylation of; textural mesoporosity and catalytic activity of
 mesoporous mol. sieves with wormhole framework
 structures
 104-54-1
 alkylation with; textural mesoporosity and catalytic activity of
 mesoporous mol. sieves with wormhole framework
 structures
 7631-86-9, uses
 64-17-5, properties
 67-56-1, properties
 71-23-8, properties
 textural mesoporosity and catalytic activity of mesoporous mol.
 sieves with wormhole framework structures

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131:234763

A novel fluorine production process in a proton exchange membrane
 reactor.
 Lowrey, Robert; Doyle, Marc; Anderson, Tim (Department of Chemical
 Engineering, School of Engineering, University of Florida, Gainesville,
 FL 32611, USA). Electrochem. Solid-State Lett., 2(10), 519-521
 (English) 1999 Electrochemical Society. CODEN: ESLEF6. ISSN:
 1099-0062. DOCUMENT TYPE: Journal CA Section: 72
 (Electrochemistry)
 Fluorine prodn. was demonstrated in a Nafion 115 membrane-sepd.
 electrochem. reactor. Direct oxidn. of anhyd. HF from the gas-phase
 did not occur. Instead, the bifluoride ion (HF_2^-) abundant in $\text{KF}\cdot\text{xHF}$
 molten salt was a necessary reactant for sustained fluorine evolution.
 Transport of bifluoride ion to catalyst-coated ELAT or membrane
 electrode assembly electrodes was hindered by electrostatic
 exclusion from the perfluorinated ionomer soln. catalyst binder and
 membrane. The anode was flooded with $\text{KF}\cdot\text{xHF}$ molten salt to
 circumvent transport restrictions by providing HF_2^- directly to the anode
 surfaces. Galvanostatic operation at 0.5 kA/m² yielded fluorine at 7.2 V
 with 62% current efficiency.

Keywords

fluorine prodn proton exchange Nafion membrane reactor

Index Entries

Membrane reactors
 novel fluorine prodn. process in a proton exchange membrane
 reactor
 Electric impedance
 of Nafion membrane-sepd. cells
 Electric current-potential relationship
 steady-state; for proton exchange membrane reactor
 77950-55-1
 novel fluorine prodn. process in a proton exchange Nafion
 membrane reactor
 7664-39-3, reaction products with potassium hydrogen difluoride
 7789-29-9, reaction products with hydrofluoric acid
 novel fluorine prodn. process in a proton exchange Nafion
 membrane reactor using

7782-41-4, preparation
novel fluorine prodn. process in a proton exchange membrane
reactor

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130:317114

On apparatus for studying catalysts and catalytic processes using
neutron scattering.

Turner, J. F. C.; Done, R.; Dreyer, J.; David, W. I. F.; Catlow, C. R. A.
(The Royal Institution of Great Britain, London W1X 4BS, UK). Rev.
Sci. Instrum., 70(5), 2325-2330 (English) 1999 American Institute of
Physics. CODEN: RSINAK. ISSN: 0034-6748. DOCUMENT TYPE:

Journal CA Section: 67 (Catalysis, Reaction Kinetics, and Inorganic
Reaction Mechanisms) Section cross-reference(s): 71

The design of a cell, built to investigate catalysis and catalytic
processes, is reported. The cell is for use at ISIS spallation neutron
source at the Rutherford Appleton Lab. It is required to operate in a
dual manner either under gas flows of controlled compn. at low
pressure (ambient -5 bar) and at high vacuum (10⁻⁶ mbar working
pressure). The temp. range of this cell is 4-1273 K. It will be used on a
variety of instrument beam lines on ISIS. In use the cell is attached
either to a furnace or cryofurnace center-stick assembly and gas is
supplied from a gas circuit assembly.

Keywords

neutron scattering app study catalyst catalytic process

Index Entries

Catalysts

Neutron scattering

app. for studying catalysts and catalytic processes using neutron
scattering

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130:267959

Nanoscale Fibrils and Grids: Aggregated Structures from Rigid-Rod
Conjugated Polymers.

Kim, Jinsang; McHugh, Sean K.; Swager, Timothy M. (Department of
Chemistry and Department of Materials Science and Engineering,
Massachusetts Institute of Technology, Cambridge, MA 02139, USA).
Macromolecules, 32(5), 1500-1507 (English) 1999 American Chemical
Society. CODEN: MAMOBX. ISSN: 0024-9297. DOCUMENT TYPE:

Journal CA Section: 36 (Physical Properties of Synthetic High
Polymers) Section cross-reference(s): 73

Langmuir-Blodgett (LB) mol. processing of conjugated polymers
[poly(phenylene ethynylenes)] into highly aligned films has revealed
conditions for the formation of liq. cryst. monolayer films that structurally
evolve into fibril aggregates. The structural requirements for
poly(phenylene ethynylene)s to display liq. cryst. phases capable or
alignment by LB methods were detd. The reconstruction of monolayers
into fibril structures requires a low glass-transition temp. (T_g), weak
surface anchoring, and a monolayer with a high energy that can be
stabilized by reorganization. This assembly of polymers into
aggregated structures produces rigid structural units analogous to
naturally occurring fibrous proteins such as collagen and elastin. These
oriented, shape-persistent nanoscale structures create new
possibilities for the construction of complex supramol. structures, and
this capability was demonstrated by the formation of a nanoscale grid.

Keywords

polyphenylene ethynylene Langmuir Blodgett processing aligned film
fibril structure polyphenylene polyacetylene aggregation phase
transition
supramol structure rigid rod polyphenylene ethynylene reorganization

Index Entries

Polymer phase morphology
fibrils; nanoscale fibril and supramol. structures from rigid-rod
poly(phenylene-ethynylene) and polyacetylene-phenylene
conjugated polymers
Adsorbed monolayers
Fibrils (fibers)
Free volume
Glass transition temperature
Langmuir-Blodgett multilayers
Liquid crystalline polymers
Optical anisotropy
Rigid polymer chains
Self-assembly
Supramolecular structure
Transitions in liquid crystals
Conjugated polymers
nanoscale fibril and supramol. structures from rigid-rod
poly(phenylene-ethynylene) and polyacetylene-phenylene
conjugated polymers
Polyoxyphenylenes
polyacetylene; nanoscale fibril and supramol. structures from
rigid-rod poly(phenylene-ethynylene) and
polyacetylene-phenylene conjugated polymers
Polyacetylenes, properties
polyphenylene; nanoscale fibril and supramol. structures from
rigid-rod poly(phenylene-ethynylene) and
polyacetylene-phenylene conjugated polymers
20743-98-0
222405-91-6
222405-92-7
intermediate; nanoscale fibril and supramol. structures from
rigid-rod poly(phenylene-ethynylene) and
polyacetylene-phenylene conjugated polymers
7681-65-4
28966-81-6
169693-99-6
222405-93-8
222405-95-0
1066-54-2
1310-58-3, reactions
7553-56-2, reactions
222405-90-5
nanoscale fibril and supramol. structures from rigid-rod
poly(phenylene-ethynylene) and polyacetylene-phenylene
conjugated polymers
14221-01-3
polymn. catalyst; nanoscale fibril and supramol. structures from
rigid-rod poly(phenylene-ethynylene) and
polyacetylene-phenylene conjugated polymers
112-29-8
150-76-5
starting material; nanoscale fibril and supramol. structures from
rigid-rod poly(phenylene-ethynylene) and
polyacetylene-phenylene conjugated polymers

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130:196677

New allylation and [3+2]-cycloaddition methodology using allylic (cyclopentadienyl)iron(II) dicarbonyl complexes.

Jiang, Songchun; Agoston, Gregory E.; Chen, Ti; Paz-Cabal, Maria; Riaz, Uzma; Ahsan, Khalid; Turos, Edward (Department of Chemistry, State University of New York, Buffalo, NY 14260, USA). Recent Res. Dev. Org. Chem., 1, 229-237 (English) 1997 Transworld Research Network. CODEN: RDOCFJ. DOCUMENT TYPE: Journal; General Review CA Section: 29 (Organometallic and Organometalloidal Compounds)

A review with 34 refs. of studies on new synthetic methodol. based on Lewis acid-promoted reactions of allyl(cyclopentadienyl)iron dicarbonyl complexes with carbonyl compds. is presented. Addn. of the title allyliron complex to aldehydes, ketones, N-tosylimines, and cyclic acetals occurs in the presence of B trifluoride etherate, yielding a zwitterionic Fe-olefin pi-complex. These pi-salts can be further used for the construction of either acyclic (polyol) or heterocyclic (furan, pyrrolidine) structures by way of a nucleophilic addn. of an alkoxide onto the olefin complex. Methoxide and primary alkoxides add to the internal alkene center of the pi-complex in a regiospecific manner to give beta-alkoxyalkyliron complexes, which upon stirring with methanolic ceric ammonium nitrate soln. and subsequent redn. with Li borohydride give 1,3,5-triol derivs. Alternatively, treatment of the zwitterionic salt with K t-butoxide in CH₂Cl₂ gives the furan cycloadduct by intramol. addn. of the homoallylic alkoxide onto the terminus of the pi-complex. The two-step procedure of allylation followed by cyclization can be performed using a Lewis acid catalyst without isolation of the intermediate pi-complex. Pyrrolidine esters can likewise be prepd. from N-tosylimines. [3+2]-Cycloaddns. involving aldehydes or N-tosylimines are best executed using ZnCl₂ as the catalyst, while TiCl₄ is preferred for reactions of ketone. Intramol. [3+2]-annulations can be effected under ZnCl₂ catalysis to provide multicyclic fused furan rings in a single synthetic operation. This methodol. holds promise for the rapid assembly of bicyclic and tricyclic furan rings similar to those found in naturally occurring substances.

Keywords

review allylation cycloaddn allyliron complex
iron allyl allylation cycloaddn review

Index Entries

Allylation

[3+2] Cycloaddition

allylation and [3+2]-cycloaddn. methodol. using allylic (cyclopentadienyl)iron(II) dicarbonyl complexes
15438-31-0, allylic cyclopentadienyl dicarbonyl complexes, preparation
allylation and [3+2]-cycloaddn. methodol. using allylic (cyclopentadienyl)iron(II) dicarbonyl complexes

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130:193561

Caged HIV-1 Protease: Dimerization Is Independent of the Ionization State of the Active Site Aspartates.

Short, Glenn F., III; Lodder, Michiel; Laikhter, Andrei L.; Arslan, Tuncer; Hecht, Sidney M. (Departments of Chemistry and Biology, University of Virginia, Charlottesville, VA 22901, USA). J. Am. Chem. Soc., 121(2), 478-479 (English) 1999 American Chemical Society. CODEN: JACSAT. ISSN: 0002-7863. DOCUMENT TYPE: Journal CA Section: 7 (Enzymes)

To further define the nature of active site involvement in dimer assembly, we have prepd. HIV-1 protease analogs having altered hydrogen bonding properties at position 25. In vitro suppression of a UAG codon introduced into position 25 of HIV-1 protease was effected

by using misacylated suppressor tRNAs affording proteins in which Asp25 was replaced with analogs. We demonstrate (i) the elaboration of HIV-1 proteases that can be activated by using a water-sol. palladium catalyst or light, (ii) that deprotection of a caged mutant of HIV-1 protease can restore proteolytic function, and (iii) that HIV-1 protease dimer assembly proceeds even if the active site aspartates cannot ionize.

Keywords

HIV1 protease dimerization hydrogen bond

Index Entries

Hydrogen bond

Quaternary structure (protein)

prepn. of caged HIV-1 protease with altered hydrogen bonding

properties

144114-21-6

56-84-8, preparation

68812-95-3

99792-99-1

220785-34-2

220785-36-4

30759-43-4

220785-37-5

220785-38-6

220785-39-7

220785-41-1

127129-97-9

prepn. of caged HIV-1 protease with altered hydrogen bonding

properties

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130:183212

Hybrid Nanoparticles with Block Copolymer Shell Structures.

Watson, Keith J.; Zhu, Jin; Nguyen, SonBinh T.; Mirkin, Chad A.

(Department of Chemistry, Northwestern University, Evanston, IL 60208, USA). J. Am. Chem. Soc., 121(2), 462-463 (English) 1999

American Chemical Society. CODEN: JACSAT. ISSN: 0002-7863.

DOCUMENT TYPE: Journal CA Section: 37 (Plastics Manufacture and Processing) Section cross-reference(s): 35, 67

Transition-metal-catalyzed ring-opening metathesis polymn. (ROMP) and surface-functionalized gold nanoparticles (GNPs) were used to produce hybrid org.-inorg. nanoparticles with chem. tailorable shell properties. Two key steps are involved in synthesis of metathesis-ready GNPs; first

1-mercapto-10-(exo-5-norbornen-2-oxy)decane (I) was prepd., then it was immobilized on 3-nm Au particles. The nanoparticles are prepd. by reducing H₂AuCl₄ in a 3:1 mixt. of 1-dodecanethiol and I to yield GNPs modified with the two adsorbates. Metathesis of the norbornene rings on the GNPs with catalyst Cl₂Ru(PCy₃)₂CHPh was achieved in less than 10 min in CDCl₃; subsequent addn. of a redox-active ferrocenyl norbornene complex led to co-polymn. The GNP-polymer hybrids can be dispersed in various polar org. solvents such as CH₂Cl₂ and THF; this soly. mirrors that of untethered ferrocenyl homopolymer. Two different norbornenyl ferrocenyl derivs. were grown from surfaces of GNP particles modified with I, which demonstrates the generality and scope of the strategy for prepg. hybrid nanoparticles. The homopolymers and block copolymers formed exhibit broad cyclic voltammetry waves characteristic of sluggish electron transfer. The method is proven for prepn. of nanoparticles that can be functionalized with polymeric layers of virtually any norbornenyl-contg. monomer. The hybrid structures are promising as diagnostic probes in chem. and

biochem. detection strategies, and building blocks for particle assembly strategies.

Keywords

gold core norbornenyl block copolymer shell hybrid nanoparticle
ring opening metathesis polymn norbornenyl ferrocenyl adsorbate gold

Index Entries

Interfacial structure

gold/adsorbate; method for prepn. of hybrid nanoparticles with gold core and norbornenyl-contg. block copolymer shell

Adsorbed substances

Electron transfer

Hybrid organic-inorganic materials

Metathesis

Nanoparticles

Polymer surface morphology

ROMP (polymerization)

Solubility

method for prepn. of hybrid nanoparticles with gold core and norbornenyl-contg. block copolymer shell

220577-93-5

block; method for prepn. of hybrid nanoparticles with gold core and norbornenyl-contg. block copolymer shell

172222-30-9

metathesis catalyst; method for prepn. of hybrid nanoparticles with gold core and norbornenyl-contg. block copolymer shell

7440-57-5, preparation

220577-91-3

79-37-8

112-55-0

124-41-4

1271-42-7

1287-16-7

2890-98-4

7440-23-5, reactions

10387-40-3

16903-35-8

66605-79-6

220577-95-7

220577-97-9

220577-99-1

method for prepn. of hybrid nanoparticles with gold core and norbornenyl-contg. block copolymer shell

220577-87-7

220577-89-9

monomer; method for prepn. of hybrid nanoparticles with gold core and norbornenyl-contg. block copolymer shell

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130:179901

Synthesis of metalloproteins involved in photosynthesis: Plastocyanin and cytochromes.

Merchant, Sabeeha (Department of Chemistry and Biochemistry,

University of California, Los Angeles, CA 90095-1569, USA). Adv.

Photosynth., 7(Molecular Biology of Chloroplasts and Mitochondria in

Chlamydomonas), 597-611 (English) 1998 Kluwer Academic

Publishers. CODEN: ADPHFM. ISSN: 1382-4252. DOCUMENT

TYPE: Journal; General Review CA Section: 11 (Plant Biochemistry)

A review with 84 refs. The introduction of a metal cofactor broadens the catalytic repertoire of a protein catalyst by facilitating certain types of chem. reactions. The chem. of the cofactor depends upon the type

of coordinating ligands, and also upon the geometry of the metal-contg. active site. Metalloprotein biosynthesis requires (1) mechanisms of metal acquisition and transport to the subcellular compartment where metal delivery to the active site of the metalloprotein can occur, and (2) mechanisms of coordinate regulation of polypeptide synthesis with cofactor synthesis (for org. cofactors like heme) or assimilation (for inorg. cofactors like the Mn4 cluster). The copper-responsive accumulation of copper-contg. plastocyanin and heme-contg. cytochrome c6 in *Chlamydomonas reinhardtii* has served as a model for studies of regulation of metalloproteins by metals because the simple growth requirements of *Chlamydomonas* facilitate studies of metal metab. In a fully copper-supplemented medium, plastocyanin accumulates in *C. reinhardtii* but Cyt c6 does not. As the medium is depleted of copper ($< 8 \times 10^6$ Cu/cell), mechanisms for adaptation to copper-deficiency are induced. These include degrdn. of plastocyanin, transcriptional activation of *Cyc6* and *Cpx1* genes (encoding Cyt c6 and coprogen oxidase, resp.), and induction of copper transport and cupric reductase activity. Studies of chloroplast metalloprotein assembly in *Chlamydomonas* have focused primarily on the heme proteins, with the c-type cytochromes being the best studied examples. The occurrence and distribution in the genome databases of *Ccs* genes required for chloroplast c-type cytochrome maturation suggests that they represent a third family of cytochrome maturation components, distinct from the Cyt c/c1 heme lyases of mammalian and fungal mitochondria and also distinct from the components identified in most proteobacteria and plant mitochondria. Approaches for the anal. of the assembly of other cofactor-contg. chloroplast proteins are discussed.

Keywords

review photosynthesis metalloprotein plastocyanin cytochrome

Index Entries

Photosynthesis (biological)

Cytochromes

Plastocyanins

synthesis of metalloproteins involved in photosynthesis:

plastocyanin and cytochromes

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130:168735

Oxidation catalysts and molecular assemblies in electropolymerized thin films.

Moss, John Abbott (Univ. of North Carolina, Chapel Hill, NC, USA).

200 pp. Avail. UMI, Order No. DA9840964 From: Diss. Abstr. Int., B

1999, 59(7), 3470 (English) 1998. DOCUMENT TYPE: Dissertation

CA Section: 35 (Chemistry of Synthetic High Polymers) Section

cross-reference(s): 67, 72

Abstract Unavailable

Keywords

electrochem polymn pyridinyl mol assembly oxidn catalyst

mol assembly polymer modified photoelectrode

Index Entries

Electrochemical polymerization

Oxidation catalysts

Photoelectrodes

oxidn. catalysts and mol. assemblies in electropolymd. thin films

Polymers, miscellaneous

pyridine-contg.; oxidn. catalysts and mol. assemblies in

electropolymd. thin films

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130:154626

Epoxy thermosetting resin compositions for packaging electronic device.

Konarski, Mark; Szczepniak, Zbigniew A. (Loctite Corporation, USA).

PCT Int. Appl. WO 9905196 A1 4 Feb 1999, 26 pp. DESIGNATED

STATES: W: AU, BR, CA, CN, ID, JP, KR, MX, RU, US; RW: AT, BE,

CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE.

(English). (World Intellectual Property Organization). CODEN: PIXXD2.

CLASS: ICM: C08G059-68. ICS: H01L023-02. APPLICATION: WO

1998-US15578 22 Jul 1998. PRIORITY: US 1997-53592 24 Jul 1997.

DOCUMENT TYPE: Patent CA Section: 38 (Plastics Fabrication and

Uses) Section cross-reference(s): 37, 76

The compn. capable of sealing underfilling between a elec. connected semiconductor device and a circuit board, comprises an epoxy resin and a latent hardener contg. a cyanate ester and an imidazole. The compn. rapidly fills the underfill space in a semiconductor device (such as a flip chip assembly contg. a semiconductor chip mounted on a carrier substrate), enables the semi-conductor to be securely connected to a circuit board by short-time heat curing and with good productivity, and demonstrates acceptable heat shock properties (or thermal cycle properties). Thus, 92 parts bisphenol F epoxy resin was mixed with 4 parts 2-ethyl-4-methylimidazole and 4 parts 1,3-bis[4-cyanatophenyl-1-(methylethylidene)]benzene (Arocy 366) to give a mixt. having no viscosity change after storage for 3-6 mo at -20°, which was dispensed through a syringe into a junction between a carrier substrate and a semiconductor chip in a formed assembly, and baked at 150°, showing initial curing after 1 min and complete curing after 15 min.

Keywords

epoxy resin electronic device packaging
cyanate ester imidazole curing agent epoxy resin

Index Entries

Semiconductor devices

epoxy thermosetting resin compns. for packaging

Crosslinking catalysts

Electronic packaging materials

Epoxy resins, uses

epoxy thermosetting resin compns. for packaging electronic device

288-30-2

288-32-4, uses

484-47-9

670-96-2

693-98-1

930-62-1

931-36-2

1728-97-8

1965-19-1

2818-82-8

2851-95-8

4051-59-6

4316-42-1

13682-34-3

13750-62-4

14691-35-1

23328-87-2

23996-12-5

23996-16-9

23996-25-0
 23996-55-6
 24910-31-4
 30639-17-9
 33214-18-5
 38668-46-1
 83689-34-3
 95815-86-4
 220170-99-0
 220171-00-6
 220171-01-7
 220184-83-8
 220184-84-9
 220184-85-0
 220184-86-1
 curing catalyst; epoxy thermosetting resin compns. for packaging
 electronic device
 16731-68-3
 220202-07-3
 epoxy thermosetting resin compns. for packaging electronic device

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130:57339
 Self-assembly and electronic structure of bundled single- and
 multi-wall nanotubes.
 Tomanek, David (Department of Physics and Astronomy and Center
 for Fundamental Materials Research, Michigan State University, East
 Lansing, MI 48824-1116, USA). AIP Conf. Proc., 442(Electronic
 Properties of Novel Materials--Progress in Molecular Nanostructures),
 159-163 (English) 1998 American Institute of Physics. CODEN:
 APCPCS. ISSN: 0094-243X. DOCUMENT TYPE: Journal; General
 Review CA Section: 65 (General Physical Chemistry)
 A review with 26 refs. Detailed growth mechanism of single-wall
 nanotube bundles and of multi-wall nanotubes of carbon is investigated
 using ab initio and parametrized calcns. Single-wall tubes grow only in
 presence of a catalyst, whereas multi-wall tubes, stabilized at the
 growing edge by a covalent "lip-lip" interaction, may form in a pure
 carbon atm. The individual tubes in these systems are likely to exhibit a
 low-frequency twisting motion. The weak, partly anisotropic inter-wall
 interaction, present in single-wall nanotube bundles and in multi-wall
 nanotubes, may cause significant changes in the d. of states near the
 Fermi level.

Keywords

growth electronic structure bundled single multiwall carbon nanotube
 review

Index Entries

Cluster structure
 Density of states
 Electronic structure
 Nanostructures
 Carbon nanotubes
 self-assembly and electronic structure of bundled single- and
 multi-wall nanotubes

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130:40870
 Research on the performance of Nafion-impregnated oxygen electrode
 in PEMFC.
 Si, Yongchao; Han, Zuoqing; Chen, Yanxi (Dep. Appl. Chem., Tianjin

Univ., Tianjin 300072, Peop. Rep. China). Dianyuan Jishu, 22(5), 204-206 (Chinese) 1998 Dianyuan Jishu Bianjibu. CODEN: DIJIFT. ISSN: 1002-087X. DOCUMENT TYPE: Journal CA Section: 52 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 38, 72

The effect of gas diffusion layer on the performance of MEA (membrane electrode assembly) is studied. The comparison of performance between Nafion-impregnated oxygen electrode and PTFE-bonded oxygen electrode is made and the reason for improving the performance of Nafion-impregnated electrode is also analyzed. Based on the exptl. results and reasonable anal., the following conclusions are drawn: membrane electrode assembly with carbon paper as gas diffusion layer has better performance; in order to promote the performance, it's beneficial to use carbon paper with low resistance as gas diffusion layer; and Nafion impregnation promotes the performance of electrode. The reason is due to the extension of three-dimension reaction region of oxygen redn. reaction after Nafion seeps into the pores of catalyst layer.

Keywords

fuel cell Nafion impregnated oxygen electrode

Index Entries

Polyoxyalkylenes, uses
fluorine- and sulfo-contg., ionomers; performance of
Nafion-impregnated oxygen electrode in polymer electrolyte
membrane fuel cell
Fuel cell anodes
Fuel cells
performance of Nafion-impregnated oxygen electrode in polymer
electrolyte membrane fuel cell
Fluoropolymers, uses
polyoxyalkylene-, sulfo-contg., ionomers; performance of
Nafion-impregnated oxygen electrode in polymer electrolyte
membrane fuel cell
Ionomers
polyoxyalkylenes, fluorine- and sulfo-contg.; performance of
Nafion-impregnated oxygen electrode in polymer electrolyte
membrane fuel cell
7440-44-0, uses
paper; performance of Nafion-impregnated oxygen electrode in
polymer electrolyte membrane fuel cell
7782-44-7, reactions
performance of Nafion-impregnated oxygen electrode in polymer
electrolyte membrane fuel cell

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131:359459

Rapid derivatization of mesoporous thin-film materials based on Re(I) zinc-porphyrin 'molecular squares': selective modification of mesopore size and shape by binding of aromatic nitrogen donor ligands.

Belanger, S.; Keefe, M. H.; Welch, J. L.; Hupp, J. T. (Department of Chemistry and Materials Research Center, Northwestern University, Evanston, IL, USA). Coord. Chem. Rev., 190-192, 29-45 (English) 1999 Elsevier Science S.A. CODEN: CCHRAM. ISSN: 0010-8545.

DOCUMENT TYPE: Journal; General Review CA Section: 78 (Inorganic Chemicals and Reactions) Section cross-reference(s): 68 A review with 41 ref. Mol. materials based on thin films of Zn-contg. tetraporphyrinic square assemblies with corner Re(CO)3Cl units, [Re(CO)3Cl(Zn-5-15-Py2P)]4, can be rapidly and, in many cases, completely functionalized by exposure to aq. or alkane solns. of good

N-donor ligands such as pyridine and imidazole. Modification can also be achieved via direct vapor-phase exposure of films to volatile ligands. In both expts. modification is a consequence of simple Zn(II) coordination chem. and is facilitated by the exceptional mesoporosity of the parent material. Vapor-phase quartz crystal microbalance expts. indicated an av. ligand/component square binding stoichiometry of 2.5, in fair agreement with the stoichiometry of 4 implied by absorbance measurements and expected from the no. of Zn(II) sites per assembly. Systematic studies with 9 of the >40 total ligands examd., show that ligand binding strength is controlled by both ligand basicity (s electron donating ability) and ligand solvophobic phenomena. In several instances the film modification chem. is reasonably persistent; in a few instances the modification was demonstrably permanent. For modified mesoporous films in contact with liq. environment, kinetic stability could be qual. correlated with thermodyn. stability, as indicated by binding consts. Kinetic stability under these conditions, therefore, is a function of both ligand-N/Zn(II) bond strength and ligand solvophobic character. For films in contact with an inert atm. (air), kinetic stability could be correlated successfully with simply the ligand-N/Zn(II) bond strength (as inferred from the ligand pKa). The combined results support the notion that mesopore derivatization-leading to systematic alteration of component cavity size, shape, and chem. affinity-can be usefully achieved via axial ligation of metalloporphyrins. Probably the ready availability of an extended array of derivatized thin film materials could be useful in membrane-based transport applications, catalyst applications, and/or chem. sensing applications.

Keywords

review zinc porphyrin rhenium mol square derivatization
thin film mesoporous mol square binding nitrogen donor review
pore size change zinc porphyrin rhenium mol square review

Index Entries

Ligands

arom. nitrogen donor; selective modification of mesopores of
thin-film materials based on Re(I) zinc-porphyrin mol.
squares by binding of arom. nitrogen donor ligands

Formation constant

binding studies of nitrogen donor ligands with mesoporous thin-film
materials based on Re(I) zinc-porphyrin mol. squares

Complexation

Films

Nanostructures

Pore size

Supramolecular structure

selective modification of mesopores of thin-film materials based on
Re(I) zinc-porphyrin mol. squares by binding of arom.
nitrogen donor ligands

Metalloporphyrins

zinc; selective modification of mesopores of thin-film materials
based on Re(I) zinc-porphyrin mol. squares by binding of
arom. nitrogen donor ligands

198575-52-9

selective modification of mesopores of thin-film materials based on
Re(I) zinc-porphyrin mol. squares by binding of arom.
nitrogen donor ligands

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131:259637

Sintering of chlorinated Pt/g-Al₂O₃ catalysts: An in-situ study by x-ray
absorption spectroscopy.
Borgna, A.; Garetto, T. F.; Apesteguia, C. R.; Le Normand, F.;

Moraweck, B. (INCAPE (UNL-CONICET), Santa Fe 3000, Argent.). J. Catal., 186(2), 433-441 (English) 1999 Academic Press. CODEN: JCTLA5. ISSN: 0021-9517. DOCUMENT TYPE: Journal CA Section: 51 (Fossil Fuels, Derivatives, and Related Products) Section cross-reference(s): 67

In-situ EXAFS spectroscopy was used for identifying the surface species involved in the sintering of alumina-supported Pt catalysts under dried oxidizing atmospheres. A Pt/g-Al₂O₃ catalyst (0.62 wt% Pt, 0.88 wt% Cl) was heated in a 2% O₂/N₂ gaseous mixt. from 300 to 525°C for about 120 min and then kept at this temp. for up to 720 min. The main observation, which is in good agreement with ex situ TPR expts., was that chlorine is always present in the surrounding of platinum during the oxidizing treatment. The metal sintering process involved three successive steps during which the chlorine and oxygen coordinations passed through a max., whereas platinum coordination exhibited a min. Formation of Pt(OH)₄Cl₂ species was detected at the end of the first step, i.e., when the temp. reached 500°C. After about 4 h of treatment, we deduced that platinum species are made up of a metal platinum core surrounded by a double coating of oxy-chlorinated species. More precisely, EXAFS expts. suggested that surface platinum oxide is made of rigid PtO₆ octahedra, but their assembly led to a largely disordered structure. The absence of a long-range order allows the location of residual chlorine species either between the PtO₆ octahedra or at the Pt-oxidized surface shell. (c) 1999 Academic Press.

Keywords

petroleum reforming catalysts platinum chlorine EXAFS spectroscopy

Index Entries

EXAFS spectroscopy

Petroleum reforming catalysts

sintering of chlorinated Pt/g-Al₂O₃ catalysts, in-situ study by x-ray absorption spectroscopy

7440-06-4, uses

7782-50-5, uses

sintering of chlorinated Pt/g-Al₂O₃ catalysts, in-situ study by x-ray absorption spectroscopy

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131:210959

Assembly line enzymology by multimodular nonribosomal peptide synthetases: the thioesterase domain of E. coli EntF catalyzes both elongation and cyclolactonization.

Shaw-Reid, Cathryn A.; Kelleher, Neil L.; Losey, Heather C.; Gehring, Amy M.; Berg, Christian; Walsh, Christopher T. (Department of Biological Chemistry and Molecular Pharmacology, Harvard Medical School, Boston, MA 02115, USA). Chem. Biol., 6(6), 385-400 (English) 1999 Current Biology Publications. CODEN: CBOLE2. ISSN: 1074-5521. DOCUMENT TYPE: Journal CA Section: 7 (Enzymes)

EntF is a 142 kDa four domain (condensation-adenylation-peptidyl carrier protein-thioesterase) nonribosomal peptide synthetase (NRPS) enzyme that assembles the Escherichia coli N-acyl-serine trilactone siderophore enterobactin from serine, dihydroxybenzoate (DHB) and ATP with three other enzymes (EntB, EntD and EntE). To assess how EntF forms three ester linkages and cyclotrimerizes the covalent acyl enzyme DHB-Ser-S-PCP (peptidyl carrier protein) intermediate, we mutated residues of the proposed catalytic Ser-His-Asp triad of the thioesterase (TE) domain. The Ser1138Cys mutant (k_{cat} decreased 1000-fold compared with wild-type EntF) releases both enterobactin (75%) and linear (DHB-Ser)₂ dimer (25%) as products. The

His1271@Ala mutant (kcat decreased 10,000-fold compared with wild-type EntF) releases only enterobactin, but accumulates both DHB-Ser-O-TE and (DHB-Ser)2-O-TE acyl enzyme intermediates. Electrospray ionization and Fourier transform mass spectrometry of proteolytic digests were used to analyze the intermediates. These results establish that the TE domain of EntF is both a cyclotrimerizing lactone synthetase and an elongation catalyst for ester-bond formation between covalently tethered DHB-Ser moieties, a new function for chain-termination TE domains found at the carboxyl termini of multimodular NRPSS and polyketide synthases.

Keywords

nonribosomal peptide synthetase thioesterase EntF elongation cyclolactonization

Index Entries

Enzyme kinetics

thioesterase domain of EntF catalyzes both elongation and cyclolactonization

Functional sites (enzyme)

thioesterase domain of EntF; thioesterase domain of EntF catalyzes both elongation and cyclolactonization

115288-50-1

EntF; thioesterase domain of EntF catalyzes both elongation and cyclolactonization

56-45-1, biological studies

56-84-8, biological studies

71-00-1, biological studies

catalytic triad of the thioesterase domain of EntF

26764-36-3

28384-96-5

30414-15-4

formation of enterobactin by EntF

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131:185969

Wood bonding with two-component phenolic resin adhesive. Winterowd, Jack G.; Macpherson, Gerald N. (Weyerhaeuser Company, USA). U.S. US 5944938 A 31 Aug 1999, 5 pp., Cont.-in-part of U.S. Ser. No. 474,596, abandoned. (English). (United States of America). CODEN: USXXAM. CLASS: ICM: C09J005-04. NCL: 156315000. APPLICATION: US 1996-767749 17 Dec 1996. PRIORITY: US 1995-474596 7 Jun 1995. DOCUMENT TYPE: Patent CA Section: 38 (Plastics Fabrication and Uses) Section cross-reference(s): 43 Two wood surfaces are bonded by coating one wood surface with the first component of a two-component thermosetting adhesive comprising a resorcinol (I)-formaldehyde copolymer (II) or a phenol-I-HCHO copolymer (III) and an alkylene group-donor hardener such as paraformaldehyde, then coating the first component with the second component comprising II or III and an oxygen- and nitrogen-contg. heterocycle, e.g., morpholine, as an accelerator. The second component is then spread directly on top of the first in a manner to minimize mixing; e.g., by spraying. When the mating member to be bonded is placed against the adhesive-coated surface and pressure is applied the components are mixed and cured rapidly to form an adhesive bond. Cure times as low as two minutes are possible, with advantages of considerable open and closed assembly time and use of woods having higher moisture content. Thus, 4 sheets of 4.2 mm-thick Southern yellow pine veneer were roll coated with ~233 g/m2 of a compn. comprising Cascophen LT 75 100, Cascoset FM 260 catalyst 10, and 91% paraformaldehyde 20 parts, then sprayed with a compn. comprising 100 parts Cascophen LT 5235, 4 parts morpholine,

and 10 parts isopropanol, stacked together on a fifth sheet, held under 9 kg wt. for 5 min, then pressed 6 min at 1725 kPa and 100°, giving av. internal bond strength 1480 kPa, compared with 875 kPa for a com. laminated veneer lumber.

Keywords

resorcinol copolymer adhesive wood bonding
morpholine crosslinking accelerator resorcinol copolymer adhesive
phenol resorcinol formaldehyde copolymer adhesive wood

Index Entries

Boards

laminated; wood bonding with two-component phenolic resin
adhesive

Crosslinking catalysts

morpholine; wood bonding with two-component phenolic resin
adhesive

Laminated materials

panels; wood bonding with two-component phenolic resin adhesive

Adhesives

rapid-setting; wood bonding with two-component phenolic resin
adhesive

Veneers

Wood

Phenolic resins, uses

wood bonding with two-component phenolic resin adhesive
25986-71-4

Cascophen LT 5235; wood bonding with two-component phenolic
resin adhesive

110-91-8, uses

crosslinking accelerator; wood bonding with two-component
phenolic resin adhesive

24969-11-7

wood bonding with two-component phenolic resin adhesive

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131:109959

Electrical device for thermal or plasma chemical treatment of gas mixtures with solid particles.

Czernichowski, Albin; Czernichowski, Piotr (Fr.). Fr. Demande FR 2773500 A1 16 Jul 1999, 23 pp. (French). (France). CODEN:

FRXXBL. CLASS: ICM: B01J019-08. ICS: B01D053-32;

B01D053-50; B01D053-73; H05H001-32; H05H001-42; H05H001-48;

B01J008-08; B01J038-28; B01J037-34; B05B007-22; F27B015-14.

APPLICATION: FR 1998-473 13 Jan 1998. DOCUMENT TYPE:

Patent CA Section: 76 (Electric Phenomena) Section

cross-reference(s): 60, 67

The title invention concerns 2 devices for treating, in a thermal or plasma chem. manner, solid particles in the presence of elec. energy dissipated in a mixt. of these particles with neutral or reactive gas. The 1st device is constituted of an ohmic tube for passage of d.c.; this tube is gone over at the same time by a 2-phase gas-solid mixt. transported in pneumatic fashion. The dissipation of energy in intimate proximity of the mixt. in the medium is controlled by the thermodyn. temp. of the tube/mixt. assembly with very low gradients of all the parameters. The 2nd device is based on sliding elec. discharges directly produced between several points of a receiver in a 2-phase mixt. traversing the active discharges. The discharges are organized in a transversal fashion with respect to the 2-phase flow, moreover, the combustible/supporter of combustion mixt. In the environment of thermodyn. equil., a very strong mixing between the elec. discharges and the flow, of a strong dissipation of local energy, and strong

gradients of speed and energy d., and in presenting extremely active radical species, one realizes an intensification of the chem. process with adding their energies to the contribution of electricity. In these 2 reactors for well organized elec. assistance, one can effect easily multiple thermal treatments, chem. or plasma chem. or their combinations, knowing that the 2 reactors can also be put in series. The function of these devices is illustrated by preheating of powders utilized for thermal projection, an oxidizing calcination of a polluted foundry sand or deactivated catalyst particles, a partial or total calcination of an alum going, resp. to SO₂ or S, and a surface activation of org. particles.

Keywords

elec device thermal plasmachem treatment gas mixt solid particle

Index Entries

Calcination

Catalysts

Gases

Mixtures

Molding sand

Particles

Petroleum cracking catalysts

Plasma

Solids

Zeolites (synthetic), processes

elec. device for thermal or plasma chem. treatment of gas mixts.
with solid particles

74-82-8, processes

1308-38-9, processes

1344-28-1, processes

7446-09-5, processes

10043-01-3

elec. device for thermal or plasma chem. treatment of gas mixts.
with solid particles

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131:104427

Electroactive polymer materials for solid-polymer fuel cells.

Kim, Kwang J.; Shahinpoor, Mohsen; Razani, Arsalan (Artificial Muscles

Res. Inst. (AMRI), School of Eng. and Sch. Med., The Univ. of New

Mexico, Albuquerque, NM, USA). Proc. SPIE-Int. Soc. Opt. Eng.,

3669(Electroactive Polymer Actuators and Devices), 385-393 (English)

1999 SPIE-The International Society for Optical Engineering. CODEN:

PSISDG. ISSN: 0277-786X. DOCUMENT TYPE: Journal; General

Review CA Section: 52 (Electrochemical, Radiational, and Thermal
Energy Technology)

A review with 67 refs. on the potential use of electroactive polymer materials for solid-polymer fuel cells. In order to realize the fast intrinsic kinetics of the cathode reaction an efficient utilization of the Pt catalyst is necessary. In this sense, a novel concept of a fabrication technique of the membrane-electrode assembly (MEA) that consists of a Pt-deposited ion exchange membrane and two current collectors is introduced. It appears that the manufg. process of such MEAs is simple, efficient, and economical, relative to the current state-of-art MEA technol. that employs various particle distribution techniques. Also, it should be pointed out that the use of this new MEA fabrication technique could improve the rate d. of H⁺ transport significantly.

Keywords

review electroactive polymer fuel cell

Index Entries

Solid state fuel cells

electroactive polymer materials for solid-polymer fuel cells

Polymers, uses

electroactive; electroactive polymer materials for solid-polymer fuel cells

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131:92966

Fabrication of patterned amine reactivity templates using 4-chloromethylphenylsiloxane self-assembled monolayer films.

Brandow, S. L.; Chen, M. -S.; Aggarwal, R.; Dulcey, C. S.; Calvert, J. M.; Dressick, W. J. (Naval Research Laboratory, Center for Bio/Molecular Science Engineering (Code 6950), Washington, DC 20375-5348, USA). Langmuir, 15(16), 5429-5432 (English) 1999 American Chemical Society. CODEN: LANGD5. ISSN: 0743-7463. DOCUMENT TYPE: Journal CA Section: 66 (Surface Chemistry and Colloids)

A process for prepg. SAMs formed by chemisorption of silanes is described. The process exploits the photochem. of organosiloxane SAMs contg. 4-(chloromethyl)phenyl (i.e., benzyl chloride) chromophores for selective grafting of reactive amine functional groups onto irradiated regions of the SAM. Using (4-(chloromethyl)-phenyl)trichlorosilane (CMP), a SAM of CMP is generated on a silica surface. Irradn. of the CMP films at 193 nm under ambient conditions at low exposure doses (≤50 mJ/cm²) leads to HCl elimination and generates CHO-groups, which are then converted to NH₂-groups. These NH₂-groups serve as reaction sites for the selective attachment of other materials. This is exemplified with deposition of a Ni film on a CMP-SAM using a Pd catalyst.

Keywords

chloromethylphenylsiloxane SAM UV photolithog amine reactivity template fabrication

nickel electroless plating amine reactivity template phenylsiloxane SAM

Index Entries

Photolithography

UV; fabrication of photochem. generated amine reactivity templates using self-assembled monolayers of

chloromethylphenylsiloxane

Polysiloxanes, processes

chloromethylphenyl derivs.; fabrication of photochem. generated amine reactivity templates using self-assembled monolayers of

Self-assembly

fabrication of photochem. generated amine reactivity templates using self-assembled monolayers of

chloromethylphenylsiloxane

Electroless plating

of Ni films at photochem. generated amine reactivity templates prepd. by self-assembled monolayers of

chloromethylphenylsiloxane

Reductive amination

of surface aldehyde groups of self-assembled monolayers of phenylsiloxanes for fabrication of amine reactivity templates

7440-02-0, processes

electroless plating of Ni films at photochem. generated amine reactivity templates prepd. by self-assembled monolayers of chloromethylphenylsiloxane

13688-90-9

in prepn. of self-assembled monolayers of
chloromethylphenylsiloxane for fabrication of photochem.
generated amine reactivity templates
7440-21-3, processes
substrate; fabrication of photochem. generated amine reactivity
templates using self-assembled monolayers of
chloromethylphenylsiloxane on

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131:88794

Integrally connected polyhedral modular foam scaffold materials,
manufacture of molds for forming articles of the materials, and uses
thereof.

Ingber, Donald E.; Meuse, Arthur J.; Roberts, Eric R. (Molecular
Geodesics, Inc., USA). PCT Int. Appl. WO 9933641 A1 8 Jul 1999, 38
pp. DESIGNATED STATES: W: JP, US; RW: AT, BE, CH, CY, DE,
DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). (World
Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM:
B29C067-00. ICS: C08J009-00; A61L027-00; B29C033-38.

APPLICATION: WO 1998-US27397 23 Dec 1998. PRIORITY: US
1997-997574 24 Dec 1997. DOCUMENT TYPE: Patent CA Section:
38 (Plastics Fabrication and Uses) Section cross-reference(s): 55, 56,
57, 63, 67

A foam structure comprising a scaffold material of polymers, metals,
glass, proteins, etc., includes a predetd. repeating arrangement of
polyhedral modules having shapes of truncated octahedra, Kelvin
minimal surface tetrakaidecahedra, or other polyhedral shapes, and
edges of lengths of 10-9-1 m. The foam may be open-cell, in which the
polyhedral modules are formed of elongated members defining their
edges, or closed-cell, in which the polyhedral modules are formed of
substantially planar members defining their faces. The foam can be
formed by computer-aided manufg. techniques, self-assembly
techniques, or lost core molding techniques to a variety of shapes and
sizes that are useful in catalysis systems, biomedical applications,
aircraft, etc. The foam material can be designed to be multifunctional
and to provide mech. load-bearing along with other desired properties
as required. Thus, an octet truss having edges of 2-cm length and
2-mm width was fabricated via stereolithog. from epoxy resin by
constructing a computer simulation of the desired structure, selectively
polymg. a liq. polymer by a laser beam under computer control to form
3D microstructural features matching the computer-aided design
structure, and fabricating sequential thin cross-section layers, one
being polymd. atop the other, until the 3D structure is complete.

Keywords

polyhedral module foam scaffold manuf mold
epoxy resin polyhedral foam scaffold manuf
metal polyhedral foam scaffold
glass polyhedral foam scaffold
protein polyhedral foam scaffold
stereolithog computer polyhedral foam scaffold manuf
catalyst polyhedral foam scaffold
biomedical application polyhedral foam scaffold
aircraft polyhedral foam scaffold

Index Entries

Molding

Molding of polymeric materials

Sintering

Stereolithography

computer-aided; in integrally connected polyhedral modular foam

scaffold material manuf.

Design

computer-aided; integrally connected polyhedral modular foam scaffold materials, manuf. of molds for forming articles of the materials, and uses thereof

Laser machining

drilling, computer-aided; in integrally connected polyhedral modular foam scaffold material manuf.

Computers

in design and control; of integrally connected polyhedral modular foam scaffold materials, manuf. of molds for forming articles of the materials, and uses thereof

Molds (forms)

in integrally connected polyhedral modular foam scaffold material manuf.

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Spheres

integrally connected polyhedral modular foam scaffold material manuf. in shape of

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Animal tissue

Boats

Catalysts

Ceramics

Space vehicles

Vehicles

Enzymes, uses

Carbohydrates, uses

Epoxy resins, uses

Glass, uses

Lipids, uses

Metals, uses

Nucleic acids

Plastic foams

Polyamides, uses

Polyesters, uses

Polyimides, uses

Polysiloxanes, uses

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Proteins (general), uses

integrally connected polyhedral modular foam scaffold materials, manuf. of molds for forming articles of the materials, and uses thereof

Drilling

laser, computer-aided; in integrally connected polyhedral modular foam scaffold material manuf.

Dry etching

laser-induced, computer-aided; in integrally connected polyhedral modular foam scaffold material manuf.

Physicochemical simulation

of integrally connected polyhedral modular foam scaffold material manuf.

79-10-7, esters, polymers

7440-44-0, uses

9003-01-4

9011-14-7

26009-03-0

26023-30-3

26100-51-6

26124-68-5

integrally connected polyhedral modular foam scaffold materials, manuf. of molds for forming articles of the materials, and uses thereof

131:70410

Characterization of immobilized laccase and its catalytic activities.

Hyung, Kyung Hee; Shin, Woon-sup (Department of Chemistry, Sogang University, Seoul 121-742, S. Korea). J. Korean Electrochem. Soc., 2(1), 31-37 (English) 1999 Korean Electrochemical Society. CODEN: JKESFC. ISSN: 1229-1935. DOCUMENT TYPE: Journal CA Section:

7 (Enzymes)

Copper-contg. enzyme, laccase (*Rhus vernicifera*) was immobilized onto gold electrode using self-assembly technique and its surface properties and catalytic activities were examd. Laccase is an oxidoreductase capable to oxidize diphenols or diamines by 4-electron redn. of mol. oxygen without superoxide or peroxide intermediates. The electrode surfaces were modified by b-mercaptopropionate to have a net neg. charge in neutral soln. and pos. charged laccase (pI=9) was immobilized by electrostatic interaction. The successful immobilization was confirmed by cyclic voltammograms which showed typical surface-confined shapes and behaviors. The amt. of charge to reduce the surface was similar to the charge calcd. assuming the surface being covered by monolayer. The activity of the immobilized enzyme was tested by the capability of oxidizing a substrate, ABTS (2,2-azino-bis-(3-ethylbenzthioline-6-sulfonic acid)) and it was maintained for 2~3 days at 4°. The immobilized laccase showed about 10~15% activity compared to that in soln. The laccase-modified electrode showed the activity of electrocatalytic redn. of oxygen in the presence of mediator, Fe(CN)₆³⁻. The addn. of azide which is an inhibitor of laccase completely eliminated the catalytic current.

Keywords

immobilized laccase electrocatalytic redox catalyst

Index Entries

Enzyme electrodes

characterization of immobilized laccase and catalytic activities

Electrochemical oxidation catalysts

Bisphenols

Diamines

electrochem. oxidn. of diphenols and diamines by immobilized laccase; characterization of immobilized laccase and catalytic activities

Electrochemical reduction catalysts

electrochem. redn. of mol. oxygen by immobilized laccase;

characterization of immobilized laccase and catalytic activities

Enzyme immobilization

Immobilized enzymes

laccase immobilization on gold electrodes; characterization of immobilized laccase and catalytic activities

Electrochemical oxidation

of diphenols and diamines by immobilized laccase;

characterization of immobilized laccase and catalytic activities

Electrochemical reduction

of mol. oxygen by immobilized laccase; characterization of immobilized laccase and catalytic activities

80498-15-3, immobilized on gold electrodes

characterization of immobilized laccase and catalytic activities

28752-68-3

electrocatalytic oxidn. by immobilization laccase; characterization of immobilized laccase and catalytic activities

7782-44-7, processes

electrochem. redn. of mol. oxygen by immobilized laccase;

characterization of immobilized laccase and catalytic

activities

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131:62541

Apparatus for gaseous emission and noise control in exhaust gas catalytic converter.

Harris, Harold L. (Harris International Sales Corporation, USA). U.S. US 5921079 A 13 Jul 1999, 9 pp. (English). (United States of America). CODEN: USXXAM. CLASS: ICM: F01N003-00. ICS: B01D050-00. NCL: 060288000. APPLICATION: US 1997-962697 3 Nov 1997. DOCUMENT TYPE: Patent CA Section: 59 (Air Pollution and Industrial Hygiene) Section cross-reference(s): 51, 67

An exhaust gas catalytic converter for controlling emissions and noise from internal combustion engines consists of an enclosed cylindrical housing and a converter assembly coaxially mounted in the housing. The converter is a catalytic module transversely disposed within the housing between an inlet and an outlet. The center of the catalytic module is formed by a cylindrical hub closed against the flow of exhaust gases, surrounded by a catalytic cell of annular cross-section through which exhaust gases from the engine may flow, converting nitrogen oxides, carbon monoxide and unburned hydrocarbons to less noxious compds. before discharge through the outlet. The hub is normally closed against flow of exhaust gases by a closure member. The closure member is openable in response to abnormal increases in pressure from the engine exhaust to prevent damage to the catalytic cell. Perforated flow tubes are provided upstream and downstream of the catalytic module for flow through inlet and outlet chambers which surround the module, providing noise redn. Ports are provided for gas flow into and out of the converter chamber. The flow distribution in the converter is improved for increased efficiency and extended catalyst life. The converter is suitable for natural gas fueled engines.

Keywords

exhaust gas catalytic converter noise redn

Index Entries

Noise

engine; exhaust gas catalytic converter for emissions and noise control

Exhaust gas catalytic converters

exhaust gas catalytic converter for emissions and noise control

Hydrocarbons, processes

unburnt; exhaust gas catalytic converter for emissions and noise control

630-08-0, processes

11104-93-1, processes

exhaust gas catalytic converter for emissions and noise control

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131:62154

Glass fibers coated with a sizing composition, and manufacture of, and compositions containing, the sized glass fibers.

Moireau, Patrick; Roubin, Marc (Vetrotex France, Fr.). PCT Int. Appl. WO 9931025 A1 24 Jun 1999, 34 pp. DESIGNATED STATES: W:

AU, BR, CA, CN, CZ, HU, IN, JP, KR, MX, NO, PL, RU, SK, TR, UA, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (French). (World Intellectual Property Organization). CODEN: PIXXD2. CLASS: ICM: C03C025-02. APPLICATION: WO 1998-FR2757 17 Dec 1998. PRIORITY: FR 1997-15994 17 Dec 1997. DOCUMENT TYPE: Patent CA Section: 57 (Ceramics) Section cross-reference(s): 38, 58

The glass fibers are coated with a compn. consisting of a soln. contg. <5 wt.% solvent and 360 wt.% polymerizable compds., 360 wt.% of which have mol. wt. <750, and a polymerizable mixt. of compds. contg. 31 acrylic and/or 31 methacrylic reactive functions and compds. contg. 31 primary and/or 31 secondary amine reactive functions, and 20% of the polymerizable compds. contain 2 reactive functions selected from acrylic, methacrylic, primary amine, and secondary amine functions. The sizing is applied to the filaments during the drawing process before assembly. The sized fibers are suitable for reinforcing epoxy resins, polyesters, and cementitious compns. Glass fibers were sized with a compn. contg. SR 9003 (dipropoxylated neopentylglycol diacrylate) 20.0, SR 256 [2(2-ethoxyethoxy)ethylacrylate] 15.0, Silquest 174 (g-methacryloxypropyltrimethoxysilane; coupling agent) 15.0, and a compns. contg. Actiron NX3 (2,4,6-tri-dimethylaminomethylphenol; catalyst) 3.0, poly BD diamine (polybutadiene contg. 2 free amine functions and having av. mol. wt. 1200) 10.0, isophoronediamine 12.0, Nopcosta FT 504 (mineral oil- and surfactant-based textile agent) 15.0, and Silquest A 1100 (g-aminopropyltriethoxysilane; coupling agent) 10.0 wt.%.

Keywords

copolymer size glass fiber sizing
acrylate diamine copolymer size

Index Entries

Sizes (agents)

for glass fibers; compns. contg. acrylic and amine functions for copolymer formation for

Concrete

Epoxy resins, uses

Polyesters, uses

sizes for glass fibers for reinforcing of

Glass fibers, uses

sizing of; compns. contg. acrylic and amine functions for copolymer formation for

227945-36-0

227945-37-1

227950-32-5

227950-48-3

227950-72-3

227950-73-4

size, formation of; on glass fibers, after drawing

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130:360526

a- And

b-Bis(1,1,1-trifluoro-5,5-dimethyl-5-methoxyacetylacetonato)copper

(II): Transforming the Dense Polymorph into a Versatile New

Microporous Framework.

Soldatov, D. V.; Ripmeester, J. A.; Shergina, S. I.; Sokolov, I. E.; Zanina, A. S.; Gromilov, S. A.; Dyadin, Yu. A. (Contribution from the Steacie Institute for Molecular Sciences, National Research Council of Canada, Ottawa K1A 0R6, Can.). J. Am. Chem. Soc., 121(17), 4179-4188 (English) 1999 American Chemical Society. CODEN:

JACSAT. ISSN: 0002-7863. DOCUMENT TYPE: Journal CA Section:

78 (Inorganic Chemicals and Reactions) Section cross-reference(s):

23, 75

Bis(1,1,1-trifluoro-5,5-dimethyl-5-methoxy-acetylacetonato)copper(II) was prepd. in two polymorphic modifications. The orthorhombic a-form is stable and densely packed, with four trans and four cis square bischelat building blocks per unit cell. These are connected through addnl. coordination bonds to form a dense polymer network. For the

trigonal b-form, the square bischelate complex units are present exclusively as the trans isomers. The distinctive assembly of these units results in a lattice with an open pore vol. of ~17% that is accessible to a wide range of guests. The compd. has a remarkably strong affinity for the porous b-form as evident from the efficient a-to-b conversion on contact not only with liq. guests but also with org. vapors at pressures well below the satn. pressure. Although the open b-form is metastable, it has a remarkable kinetic stability, most likely because of the trans-to-cis isomerization that must accompany the b-to-a transformation. Many sorbents play a dual role as stabilizing guest and as catalyst promoting the a-to-b or b-to-a conversion. Because of its versatile sorption properties and relative robustness, the b-form of the complex can be classified as a novel org. zeolite mimic.

Keywords

crystal structure copper acetylacetonato complex alpha beta form
copper acetylacetonato complex alpha beta form prepn
zeolitic beta form copper acetylacetonato complex prepn inclusion
compd
benzene deriv inclusion zeolitic beta form copper acetylacetonato
complex

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74-86-2, reactions
115-19-5
13994-57-5
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146195-65-5
for prepn. of a- and
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inclusion compds. with the b-form
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95-47-6, reactions
95-50-1
98-06-6
98-07-7
98-08-8
98-95-3, reactions
100-41-4, reactions
100-52-7, reactions
103-65-1
106-42-3, reactions
108-38-3, reactions
108-67-8, reactions
108-86-1, reactions
108-88-3, reactions
108-90-7, reactions
352-32-9
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462-06-6
591-50-4
873-49-4
for prepn. of b-bis(trifluorodimethylmethoxyacetylacetonato)copper

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 207723-72-6
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 224949-21-7
 prepn., crystal structure and a-b transformation of

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130:354566
 Multiport cyclone separator for gas-solids separation in petroleum fluid
 catalytic cracking units.
 Jakkula, Juha (Neste Oyj, Finland). PCT Int. Appl. WO 9925469 A1 27
 May 1999, 24 pp. DESIGNATED STATES: W: AL, AM, AT, AU, AZ,
 BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB,
 GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
 LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU,
 SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW,
 AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG,
 CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML,
 MR, NE, NL, PT, SE, SN, TD, TG. (English). (World Intellectual
 Property Organization). CODEN: PIXXD2. CLASS: ICM:
 B01J008-24. ICS: B04C009-00; F23C011-02. APPLICATION: WO
 98-FI906 17 Nov 1998. PRIORITY: FI 97-4263 17 Nov 1997.
 DOCUMENT TYPE: Patent CA Section: 51 (Fossil Fuels, Derivatives,
 and Related Products) Section cross-reference(s): 47
 A method and app. for sepg. solids from gas flow in a petroleum
 fluidized cracking (FCC) process using a multiport cyclone. The gas
 flow carrying the suspended solids is passed into a sepn. assembly, in
 which the solids are centrifugally sepd. in the multiport cyclone, into
 which the gas flow is passed through an inlet nozzle having an axially
 annular cross section. A typical process gas is that formed by
 combustion gases during catalyst regeneration in fluid catalytic
 cracking.

Keywords

multiport cyclone petroleum cracking regeneration

Index Entries

Separation

gas-solid, of regenerated cracking catalysts; multiport cyclone separator for gas-solids sepn. in petroleum fluid catalytic cracking units

Cyclone separators

Petroleum cracking

Petroleum cracking catalysts

multiport cyclone separator for gas-solids sepn. in petroleum fluid catalytic cracking units

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130:325167

Organosilanetriols: model compounds and potential precursors for metal-containing silicate assemblies.

Murugavel, Ramaswamy; Bhattacharjee, Manish; Roesky, Herbert W.

(Department of Chemistry, Indian Institute of Technology, Bombay 400 076, India). Appl. Organomet. Chem., 13(4), 227-243 (English) 1999

John Wiley & Sons Ltd. CODEN: AOCHEX. ISSN: 0268-2605.

DOCUMENT TYPE: Journal; General Review CA Section: 29

(Organometallic and Organometalloidal Compounds)

The chem. of silanols and related aminosilanes is a topic of current interest in view of their possible applications as building blocks in materials science. In particular, discrete silanetriols and triaminosilanes are useful synthons for the generation of three-dimensional metallasiloxanes. Research in this area is centered around the synthesis of stable silanetriols and studies of their reactivity toward various metal precursors. Starting from stable N-bonded silanetriols and triaminosilanes, a range of metallasiloxanes and iminosilicates showing novel structural features were prepd. Elements such as Al, Ga, In, Ti, Zr, Ta, Sn and Re were incorporated in these heterosiloxane frameworks. Both the metallasiloxanes and iminosilicates were extensively characterized by IR and NMR spectroscopy and by single-crystal x-ray diffraction studies in representative cases. A (Co carbonyl cluster)-anchored aluminosiloxane is an efficient catalyst for hydroformylation reactions of olefins. Many of these metallasiloxanes and iminosilicates contain hydrolyzable functionalities such as M-C, M-OR and Si-N bonds, providing a possibility of using these compds. as starting materials for the prepn. of supramol. cage structures and synthetic zeolites under mild conditions. A review with 64 refs.

Keywords

silanetriol review

silicate assembly metal contg review

Index Entries

Silicates, preparation

organosilanetriols as model compds. and potential precursors for metal-contg. silicate assemblies

Silanes

silanetriols; organosilanetriols as model compds. and potential precursors for metal-contg. silicate assemblies

14044-95-2, org. derivs.

organosilanetriols as model compds. and potential precursors for metal-contg. silicate assemblies

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130:317043

Programming a silver nanocrystallite to recognize and bind a molecular substrate in solution.

Fullam, Stephen M.; Rao, S. Nagaraja; Fitzmaurice, Donald J.
(Department of Chemistry, University College Dublin, Dublin 4, Ire.).
Polym. Prepr. (Am. Chem. Soc., Div. Polym. Chem.), 40(1), 482-483
(English) 1999 American Chemical Society, Division of Polymer
Chemistry. CODEN: ACPPAY. ISSN: 0032-3934. DOCUMENT
TYPE: Journal CA Section: 66 (Surface Chemistry and Colloids)
The authors prepd. Ag nanocrystals modified by chemisorption of a
mixt. of dodecanethiol and dodecanethiol incorporating a
2,6-diaminopyridine moiety. It has been well established by ¹H NMR
that the nanocrystals recognize and selectively bind the mol. substrate.
Addn. of a 'diuracil' to a dispersion of these nanocrystals induced
aggregation as monitored by dynamic light scattering. These findings
represent an important step towards the development of a general
method for the 'programmed' assembly of nanocrystal assemblies in
soln.

Keywords

silver nanocrystal selective mol recognition binding

Index Entries

Chemisorbed substances

modification of Ag nanocrystals by chemisorption of a mixt. of
dodecanethiol and dodecanethiol incorporating a
2,6-diaminopyridine moiety

Aggregation

of modified Ag nanocrystal dispersions by addn. of a 'diuracil'
compd.

Molecular recognition

Nanocrystals

programming a silver nanocrystallite to recognize and bind a mol.
substrate in soln.

223654-87-3

223654-88-4

aggregation of modified Ag nanocrystal dispersions by addn. of a
'diuracil' compd.

1322-36-7

223654-86-2

7440-22-4, properties

modification of Ag nanocrystals by chemisorption of a mixt. of
dodecanethiol and dodecanethiol incorporating a
2,6-diaminopyridine moiety

14866-33-2

modification of Ag nanocrystals by chemisorption of a mixt. of
dodecanethiol and dodecanethiol incorporating a
2,6-diaminopyridine moiety in the phase transfer catalyst
(C8H17)4NBr

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130:215779

Study on the spatial resolution of a furfuryl alcohol-negative photoresist
using a holographic system.

Sthel, M.; Rieumont, J.; Martinez, R. (Center of Science and
Technology, State University of the North Fluminense, Campos dos
Goytacazes, Brazil). J. Appl. Polym. Sci., 71(11), 1749-1751 (English)
1999 John Wiley & Sons, Inc. CODEN: JAPNAB. ISSN: 0021-8995.

DOCUMENT TYPE: Journal CA Section: 74 (Radiation Chemistry,
Photochemistry, and Photographic and Other Reprographic
Processes) Section cross-reference(s): 38, 76

A neg. photoresist was obtained from furfuryl alc. using methylene
dichloride as a solvent and trifluoroacetic acid as a catalyst. A holog.

assembly with a blue laser failed to give interference patterns. However, a periodic interference pattern was printed on a film of furfuryl alc. resin using an UV laser with a coherent beam at 360 nm. The period of the pattern was reproduced throughout the film and resulted about 0.46 mm. Thus, the resin obtained was able to reach a resoln. about 0.23 m.

Keywords

photoresist furfuryl alc holog

Index Entries

Holography

Interference

Negative photoresists

study on the spatial resoln. of a furfuryl alc.-neg. photoresist using a holog. system

76-05-1, uses

75-09-2, uses

25212-86-6

study on the spatial resoln. of a furfuryl alc.-neg. photoresist using a holog. system

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130:77940

Fully integrated biocatalytic electrodes based on bioaffinity interactions.

Katz, Eugenii; Heleg-Shabtai, Vered; Bardea, Amos; Willner, Itamar; Rau, Harald K.; Haehnel, Wolfgang (Institute of Chemistry, The Hebrew University of Jerusalem, Jerusalem 91904, Israel). Biosens.

Bioelectron., 13(7-8), 741-756 (English) 1998 Elsevier Science Ltd.

CODEN: BBIOE4. ISSN: 0956-5663. DOCUMENT TYPE: Journal CA

Section: 7 (Enzymes) Section cross-reference(s): 9

Integrated bioelectrocatalytically active electrodes are assembled by the deposition of enzymes onto resp. elec. contacted affinity matrixes and further crosslinking of the enzyme monolayers. A

catalyst-NAD⁺-dyad for the binding of the NAD⁺-dependent enzymes and cytochrome-like mols. for the binding of the

heme-protein-dependent enzymes are used to construct integrated

elec. contacted biocatalytic systems. NAD⁺-dependent lactate

dehydrogenase (LDH) is assembled onto a pyrroloquinoline

quinone-NAD⁺ monolayer. The redox-active monolayer is organized

via covalent attachment of pyrroloquinoline quinone (PQQ) to a

cystamine monolayer assocd. with a Au-electrode, followed by covalent

linkage of N6-(2-aminoethyl)-NAD⁺ to the monolayer. The interface

modified with the PQQ-NAD⁺-dyad provides temporary affinity binding

for LDH and allows crosslinking of the enzyme monolayer. The

crosslinked LDH is bioelectrocatalytically active towards oxidn. of

lactate. The bioelectrocatalyzed process involves the PQQ-mediated

oxidn. of the immobilized NADH. Integrated, elec. contacted

bioelectrodes are produced by the affinity binding and further

crosslinking of nitrate reductase (NR) (cytochrome-dependent, E.C.

1.9.6.1 from E. coli) or CoII-protoporphyrin IX reconstituted myoglobin

(CoII-Mb) atop the microperoxidase-11 (MP-11) monolayer assocd.

with a Au-electrode. The MP-11 monolayer provides an affinity

interface for the temporary binding of the enzymes, that allows the

crosslinkage of the enzyme mols. The MP-11 assembly acts as

electron transfer mediator for the redn. of the secondary enzyme layer.

The integrated bioelectrodes consisting of NR and CoII-Mb show

catalytic activities for NO₃⁻ redn. and acetylenedicarboxylic acid

hydrogenation, resp. Two FeIII-protoporphyrin IX units are reconstituted

into a four α -helix bundle de novo protein assembled as a monolayer

on a Au-electrode. Vectorial electron transfer proceeds in the synthetic

heme-protein monolayer. Crosslinking of an affinity complex generated between the FeIII-protoporphyrin IX reconstituted de novo protein monolayer and NR yields an integrated, elec. contacted enzyme electrode that stimulates the bioelectrocatalyzed redn. of nitrate.

Keywords

biocatalytic electrode bioaffinity lactate dehydrogenase nitrate dehydrogenase protoporphyrin IX

Index Entries

Crosslinking
Electron transfer
Enzyme electrodes
Enzyme immobilization
fully integrated biocatalytic electrodes based on bioaffinity interactions
Myoglobins
immobilized; fully integrated biocatalytic electrodes based on bioaffinity interactions
553-12-8, immobilized
9001-60-9, immobilized
9013-03-0, immobilized
187745-19-3
218619-97-7
51-85-4
30975-71-4, immobilized
59587-50-7
72909-34-3
fully integrated biocatalytic electrodes based on bioaffinity interactions

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130:66061

Organized catalytic systems based on Fe, Al, and Cu complexes in conversions of hydrocarbons and halogen derivatives.
Rostovshchikova, T. N.; Smirnov, V. V.; Golubeva, E. N.; Zagorskaya, O. V.; Shilina, M. I. (Mosk. Gos. Univ. im. M.V.Lomonosova, Moscow, Russia). Khim. Fiz., 17(8), 63-74 (Russian) 1998 Nauka. CODEN: KHFID9. ISSN: 0207-401X. DOCUMENT TYPE: Journal; General
Review CA Section: 22 (Physical Organic Chemistry) Section
cross-reference(s): 67
A review with 38 refs. The reactions discussed include addn., substitution, olefin isomerization, alkane cracking, and carbon-hydrogen bond metathesis. For copper complexes the phenomenon of self-organization of highly active complex mixed-valent structures from simpler precursors was discussed. The kinetics of processes involving iron and aluminum halide assoc. was also discussed.

Keywords

review organized catalytic system iron aluminum copper complex hydrocarbon conversion organized catalytic system review halide conversion organized catalytic system review

Index Entries

Catalysts
Self-assembly
Hydrocarbons, reactions
Organic halides
self-organized catalytic systems based on Fe, Al, and Cu

complexes in conversions of hydrocarbons and halogen
derivs.

7429-90-5, complexes

7439-89-6, complexes

7440-50-8, complexes

catalyst; self-organized catalytic systems based on Fe, Al, and Cu
complexes in conversions of hydrocarbons and halogen
derivs.

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130:40566

Crystalline inorganic oxide compositions prepared by neutral
templating route.

Pinnavaia, Thomas J.; Tanev, Peter T. (Board of Trustees Operating
Michigan State University, USA). U.S. US 5840264 A 24 Nov 1998, 19
pp., Cont.-in-part of U.S. Ser. No. 293,806, abandoned. (English).
(United States of America). CODEN: USXXAM. CLASS: ICM:

C01B033-20. NCL: 423277000. APPLICATION: US 1994-355979 14

Dec 1994. PRIORITY: US 1994-293806 22 Aug 1994. DOCUMENT

TYPE: Patent CA Section: 49 (Industrial Inorganic Chemicals) Section
cross-reference(s): 67

This invention relates to new cryst. org. compns. having unique
combinations of framework-confined uniform meso pores and textural
meso pores and to a method for their prepn. The compns. typically
possess a framework wall thickness of ~ 17 Å, small elementary
particle size of ~ 400 Å, and ratio of textural to framework-confined
mesoporosity of ~ 0.2 . The formation of the meso-porous structure is
accomplished by a novel self-assembly mechanism involving
hydrogen bonding between neutral amine surfactant (S^0) and neutral
inorg. oxide precursor (I^0). This S^0I^0 templating approach allows for
facile and environmentally benign recycling of the cost-intensive
template by simple solvent extn. methods.

Keywords

cryst inorg oxide neutral templating route

Index Entries

Catalyst supports

Molecular sieves

Recycling

Solvents

Sorbents

Surfactants

Zeolites (synthetic), preparation

Amines, uses

Oxides (inorganic), uses

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Porous materials

mesoporous; cryst. inorg. oxide compns. prepd. by neutral
templating route

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124-22-1

2783-17-7

78-10-4

555-31-7

13421-85-7

71-36-3, uses

1314-23-4, uses

1332-29-2

1344-28-1, uses

7631-86-9, uses

cryst. inorg. oxide compns. prepd. by neutral templating route

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130:18276

Development of solid polymer electrolyte water electrolyzer with 200 cm² 5-cell.

Nakanori, Takahiro; Okisawa, Kayoko; Yamaguchi, Mikimasa (New Energy Laboratory, Fuji Electric Corporate Research and Development, Ltd., Yokosuka City 240-01, Japan). Proc. Intersoc. Energy Convers. Eng. Conf., 33rd, IECEC113/1-IECEC113/6 (English) 1998 Society of Automotive Engineers. CODEN: PIECDE. ISSN: 0146-955X. DOCUMENT TYPE: Journal; (computer optical disk) CA Section: 72 (Electrochemistry) Section cross-reference(s): 49, 52 Fuji Elec. Corporate Research and Development, Ltd. was developing technologies for high performance solid polymer electrolyte water electrolyzers in national project WE-NET. In term of tech. features, Fuji Elec.'s technol. approach calls for membrane-electrode assemblies to be formed by a hot-press method. The authors have manufd. a 200. cm² membrane-electrode assemblies by the hot-press method, and have developed a 5-cell stack with the 200 cm² membrane-electrode assembly, that registered 7.850 V of stack voltage and 93.2% of energy efficiency at 1 A/cm² and at 80° under atm. pressure. And at 5 A/cm² of high c.d., the stack registered 9.308 V of stack voltage and 79.7% of energy efficiency at 90°.

Keywords

solid polymer electrolyte water electrolyzer
membrane cell solid polymer electrolyte water
perfluorosulfonic acid polymer membrane cell water

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1333-74-0, properties
7782-44-7, properties
solid polymer electrolyte water electrolyzer with 200 cm2 5-cell for
prepn. of